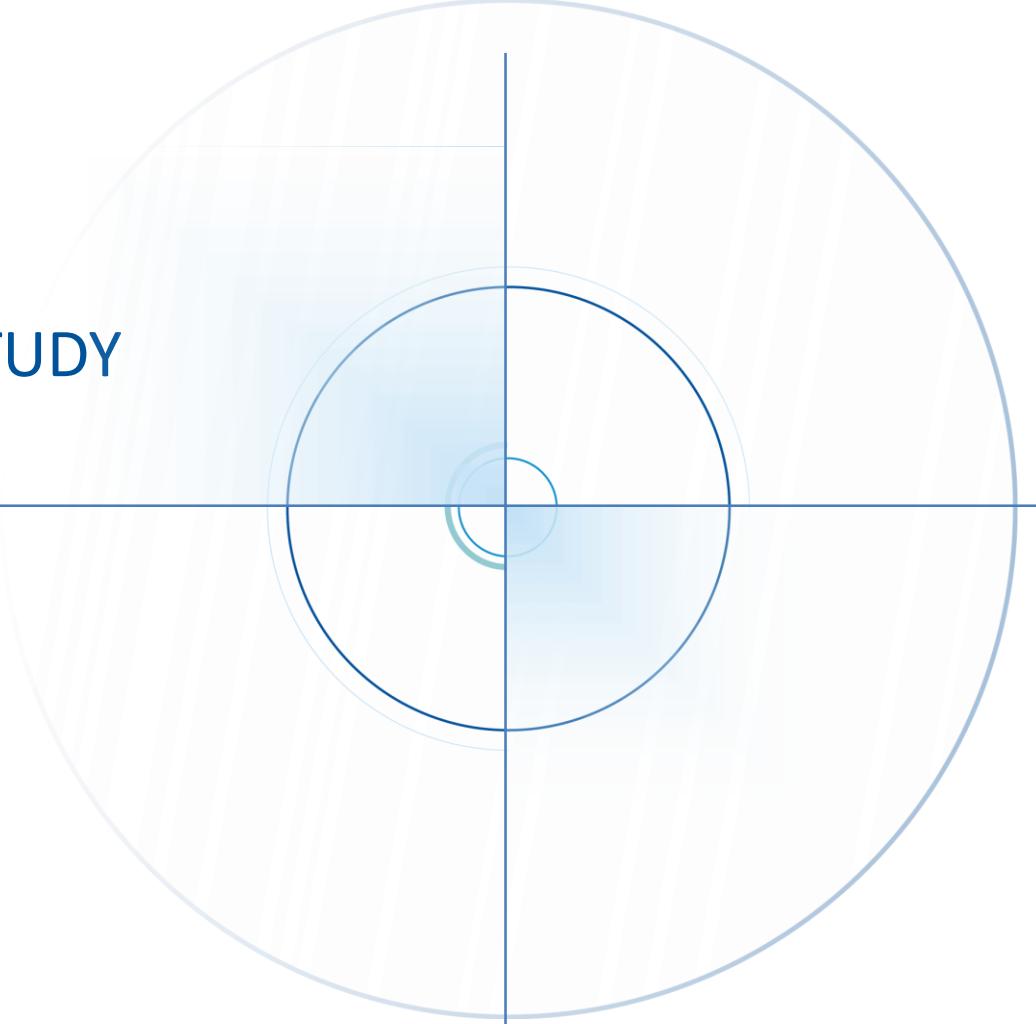


**Appendix C
Traffic Study Report**

**& Memorandum – Additional
Analysis (dated 12/21/2015)**

TRAFFIC STUDY REPORT



**Hooper Road:
Blackwater Rd to
Sullivan Rd**

Prepared for
SIGMA Consulting Group, Inc.

July 7, 2015

**CDM
Smith**

Table of Contents

Hooper Road Traffic Study.....	1
1 Introduction.....	1
1.1 Study Methodology.....	1
1.2 Traffic Operations Analysis	1
1.2.1 Control Delay and Level-of-Service.....	2
2 Existing Conditions.....	3
2.1 Study Area Roadway Network	3
2.2 Existing Traffic Volumes	3
2.4 Analysis of Existing Traffic Conditions	4
3 Traffic Analysis – Opening Year 2017	6
3.1 Traffic Volumes	6
3.2 Analysis of Proposed Traffic Conditions.....	6
4 Traffic Analysis – Design Year 2037	9
4.1 Traffic Volumes	9
4.2 Analysis of Proposed Traffic Conditions.....	9
5 Findings and Conclusion	12

List of Figures

Figure 1 Level-of-Service Illustration	3
Figure 2 Existing Turning Movement Counts	5
Figure 3 Projected Turning Movement Counts – Opening Year 2017.....	7
Figure 4 Projected Turning Movement Counts – Design Year 2037	10

List of Tables

Table 1 Intersection Level-of-Service Criteria	2
Table 2 Existing Year 2013 Intersection LOS (Morning Peak Hour).....	4
Table 3 Existing Year 2013 Intersection LOS (Afternoon Peak Hour)	4
Table 4 Opening Year 2017 Intersection LOS (Morning Peak Hour)	8
Table 5 Opening Year 2017 Intersection LOS (Afternoon Peak Hour)	8
Table 6 Opening Year 2037 Intersection LOS (Morning Peak Hour)	11
Table 7 Opening Year 2037 Intersection LOS (Afternoon Peak Hour)	11

Appendices

Appendix A	Existing Year Traffic Volumes
Appendix B	Synchro Output

Hooper Road

Traffic Study

1 Introduction

Hooper Road, between Blackwater Road and Sullivan Road, is primarily a two-lane roadway in Baton Rouge, Louisiana. As a part of the Stage 1 Environmental Services, Hooper Road is being widened to a four-lane roadway with medians. This report summarizes the analysis of existing, opening and design year traffic conditions along Hooper Road.

1.1 Study Methodology

The methodology employed in conducting this study is outlined as follows:

- Conducted a reconnaissance of the roadways and intersections in the study area using Google Maps.
- Conducted intersection turning movement counts and 24-hour classification counts at critical study area locations on a typical weekday.
- Modeled existing roadway and traffic conditions using *Synchro*, version 8.0 which is a traffic operations software program.
- Analyzed traffic operations during morning and evening peak hours of a typical weekday. Existing and future traffic analyses were conducted using capacity analysis methodology outlined in the Highway Capacity Manual (2010).
- Modeled future roadway and peak hour traffic conditions associated with the widening of Hooper Road.
- Evaluated traffic impacts of the proposed widening of Hooper Road.
- Developed and evaluated roadway and intersection improvements to mitigate identified traffic impacts.

1.2 Traffic Operations Analysis

Capacity analyses were conducted for study area intersections to evaluate existing and projected traffic operating conditions. The Highway Capacity Manual (2010) defines capacity at an intersection as the maximum hourly rate at which vehicles can reasonably be expected to pass through the intersection under prevailing traffic roadway and signalization conditions. The primary Measures of Effectiveness (MOEs) used in evaluating the traffic impacts for the proposed development were peak hour intersection control delay (measured in units of seconds per vehicle) and level-of-service (LOS).

1.2.1 Control Delay and Level-of-Service

Control delay is defined as that component of total delay caused by decelerating and accelerating at a traffic signal or stop sign. Level-of-Service (LOS) is a qualitative measure of operating conditions at an intersection based on control delay. LOS is given a letter designation from A to F, where LOS A represents free-flow conditions and LOS F represents heavy congestion. The relationship between the various LOS classifications and control delay is summarized for un-signalized intersections in **Table 1**. These LOS classifications are also illustrated in **Figure 1**.

Table 1 Intersection Level-of-Service Criteria

Level of Service (LOS)	Average Control Delay (sec/veh)		Description
	Signalized Intersections	Unsignalized Intersections	
A	0 - 10	0 - 10	Very low vehicle delays, free traffic flow, signal progression extremely favorable, most vehicles arrive during given signal phase.
B	> 10 - 20	> 10 - 15	Good traffic flow, good signal progression, more vehicles stop and experience higher delays than for LOS A.
C	> 20 - 35	> 15 - 25	Stable traffic flow, fair signal progression, significant number of vehicles stop at signals.
D	> 35 - 55	> 25 - 35	Noticeable traffic congestion, longer delays and unfavorable signal progression, many vehicles stop at signals.
E	> 55 - 80	> 35 - 50	Unstable traffic flow, poor signal progression, significant congestion, traffic near roadway capacity, frequent traffic signal cycle failures.
F	> 80	> 50	Unacceptable delay, extremely unstable flow, heavy congestion, traffic exceeds roadway capacity, stop-and-go conditions.

Source: [Highway Capacity Manual](#), Transportation Research Board, 2010

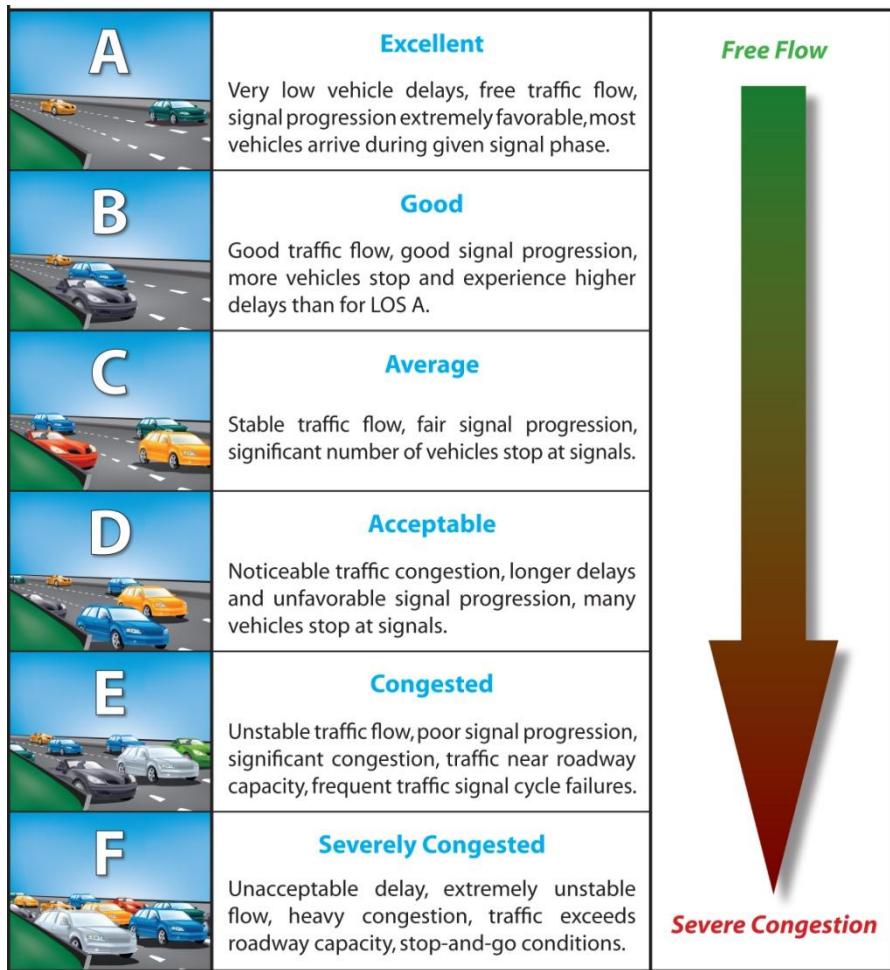


Figure 1 Level-of-Service Illustration

2 Existing Conditions

This section describes the existing transportation conditions along Hooper Road within the study limits (between Blackwater Road and Sullivan Road). The analysis of existing conditions provides the basis for evaluating traffic impacts of the proposed widening.

2.1 Study Area Roadway Network

Hooper Road, between Blackwater Road and Sullivan Road, is primarily a two-lane roadway with no median. However, at the intersections of Blackwater Road, Joor Road and Sullivan Road, Hooper Road is widened to provide four lanes of travel with left and right turn bays.

2.2 Existing Traffic Volumes

Existing intersection turning movement and 24-hour traffic counts were conducted along Hooper Road for this study. The counts were conducted for a two-hour period (6:30 am to 8:30 am) in the morning and for a two-hour period (4:30 pm to 6:30 pm) in the evening to analyze the peak hour traffic conditions. Peak hour turning movement counts are illustrated in **Figure 2**. Traffic count details are provided in **Appendix A**.

2.4 Analysis of Existing Traffic Conditions

Analysis of existing traffic conditions was conducted using *Synchro*. *Synchro* is a macroscopic simulation software developed by Trafficware® for capacity analysis of intersections that are either isolated or part of a network, and includes an evaluation of delay and queues.

Existing traffic operating conditions were evaluated and included three unsignalized intersections and one signalized intersection. Level-of-service (LOS) for these study area intersections are summarized in **Tables 2 and 3** for morning and evening peak hours of a typical weekday. Detailed software output for the capacity analyses are provided in **Appendix B**.

Analysis of the existing conditions indicates that the intersections along Hooper Road at Lansdowne Road, Lovett Road, Joor Road and Shoe Creek Drive operate at acceptable conditions during the morning and evening peak hours. The intersection of Hooper Road at Carmel Avenue operates at acceptable conditions during the morning peak hour while it operates at LOS E during the evening peak hour.

Table 2 Existing Year 2013 Intersection LOS (Morning Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			D			-		
Hooper Rd at Carmel Ave	*	*			*			B			D		
Hooper Rd at Lovett Rd	B	-	A	-	-	B	-	C	-	C	-		
Hooper Rd at Joor Rd	B	B	B	-	B	C	-	B	C	A	B	C	A
Hooper Rd at Shoe Creek Dr	*	*			*			B			-		

Source: CDM Smith, using Synchro, Version 8

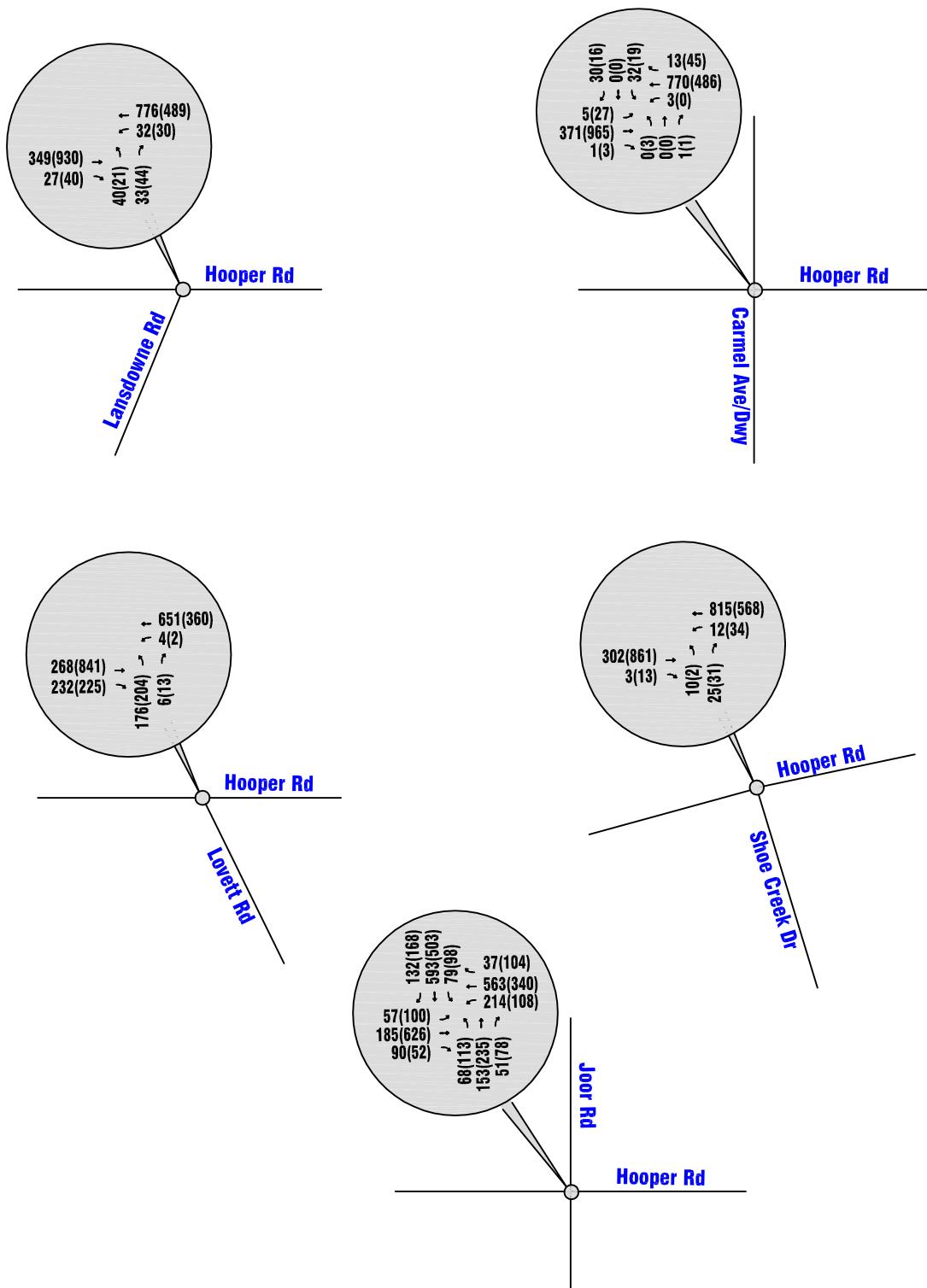
- Level of service for a one-way stop control intersection is defined by the level of service of the approaches

Table 3 Existing Year 2013 Intersection LOS (Afternoon Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			D			-		
Hooper Rd at Carmel Ave	*	*			*			E			E		
Hooper Rd at Lovett Rd	B	-	B	-	-	A	-	D	-	D	-		
Hooper Rd at Joor Rd	B	B	C	-	B	B	-	C	C	A	B	C	A
Hooper Rd at Shoe Creek Dr	*	*			*			C			-		

Source: CDM Smith, using Synchro, Version 8

- Level of service for a one-way stop control intersection is defined by the level of service of the approaches



Source: CDM Smith, August 2014

EXISTING YEAR 2013 TURNING MOVEMENT VOLUMES

Hooper Road Traffic Study
Baton Rouge, Louisiana

Not to Scale

**CDM
Smith**

Figure 2

3 Traffic Analysis – Opening Year 2017

3.1 Traffic Volumes

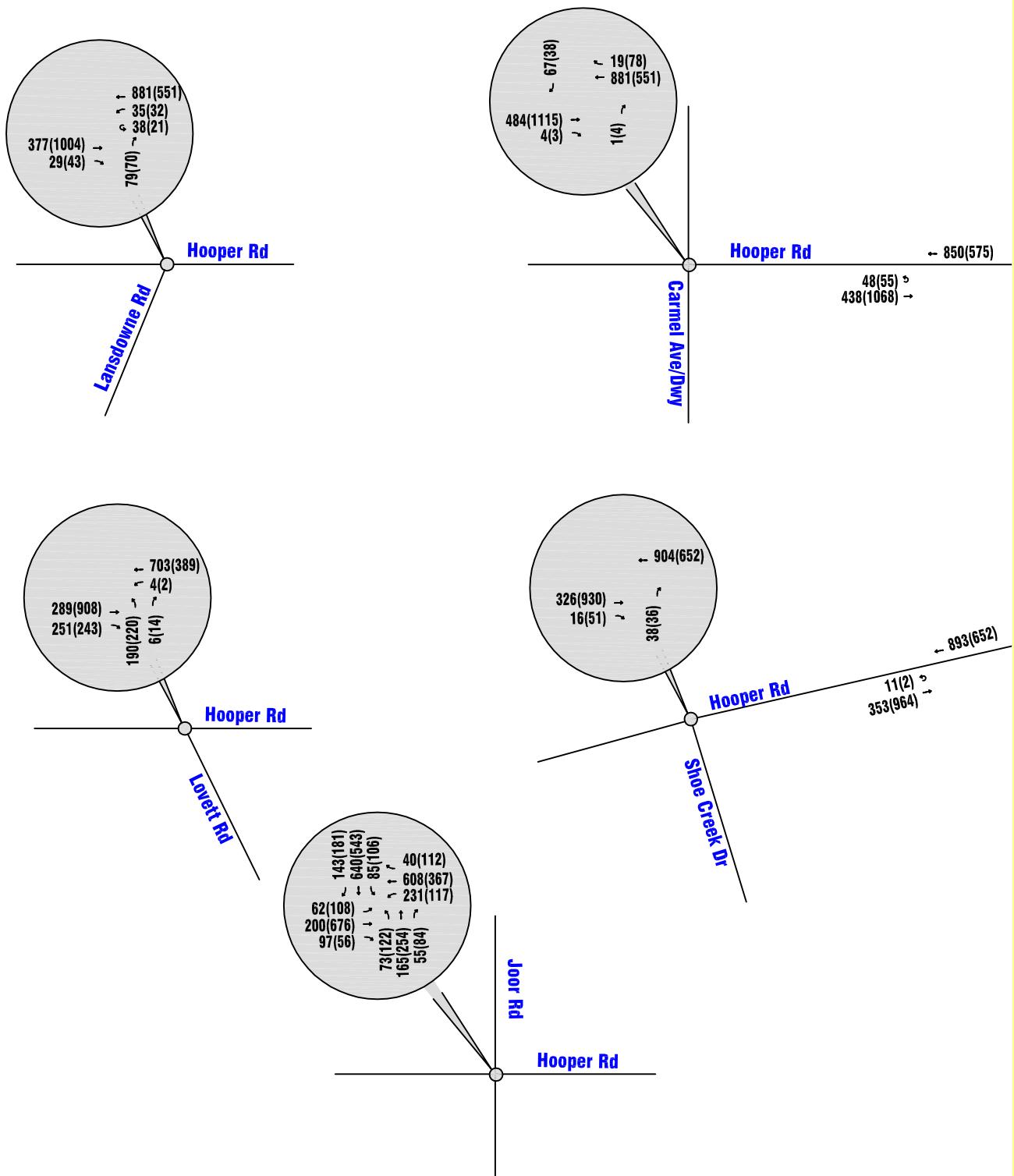
The proposed widening of Hooper Road is anticipated to be completed by year 2017. Traffic volumes on Hooper Road are assumed to grow annually at the rate of two percent through 2017. **Figure 3** illustrates the projected intersection turning movement counts along Hooper Road.

3.2 Analysis of Proposed Traffic Conditions

Along with the proposed widening of Hooper Road within the study limits, the following improvements to study area intersections are being recommended:

- Hooper Road at Lansdowne Road
 - Provide westbound left-turn lane along Hooper Road with 50 feet of storage.
 - Allow right-in/right-out only movement for Lansdowne Road.
- Hooper Road at Carmel Avenue
 - Allow right-in/right-out only movement for Carmel Avenue.
- Hooper Road at Lovett Road
 - Provide eastbound right-turn lane with 200 feet of storage.
 - Provide westbound left-turn lane with 150 feet of storage.
 - Operate westbound left-turn with protected/permitted phasing.
 - Provide northbound right-turn with 50 feet of storage.
- Hooper Road at Shoe Creek Drive
 - Allow right-in/right-out only movement for Shoe Creek Drive.
- Six U-turns are provided along Hooper Rd within the study limits – east of Carmel Avenue, east of Lovett Road, east of Idla Drive, west of Joor Road, west of Shoe Creek Drive and east of Shoe Creek Drive.

Level-of-service (LOS) for the study area intersections are summarized in **Tables 4 and 5** for morning and evening peak hours of a typical weekday respectively. The intersection analyses are conducted assuming the implementation of above listed intersection improvements. U-turn to east of Carmel Avenue and to the east of Shoe Creek Drive are analyzed as a part of this study. Since traffic counts for other minor roads were not conducted, the U-turning traffic at other locations cannot be projected. Detailed software output for the capacity analyses are provided in **Appendix B**.



Source: CDM Smith, August 2014

OPENING YEAR 2017 TURNING MOVEMENT VOLUMES

Hooper Road Traffic Study
Baton Rouge, Louisiana

Not to Scale

Table 4 Opening Year 2017 Intersection LOS (Morning Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			B			-		
Hooper Rd at Carmel Ave	*	*			*			A			B		
Hooper Rd at U-Turn (east of Carmel Ave)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											
Hooper Rd at Lovett Rd	B	-	A	-	-	B	-	C	-	B	-		
Hooper Rd at Joor Rd	C	B	B	-	B	C	-	B	C	A	B	C	A
Hooper Rd at Shoe Creek Dr	*	*			*			A			-		
Hooper Rd at U-Turn (east of Shoe Creek Dr)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											

Source: CDM Smith, using Synchro, Version 8

* Level of service for a one-way stop control intersection is defined by the level of service of the approaches

** Highway Capacity Manual methodology analyzes intersections with at least one stop control approach

Table 5 Opening Year 2017 Intersection LOS (Afternoon Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			B			-		
Hooper Rd at Carmel Ave	*	*			*			B			B		
Hooper Rd at U-Turn (east of Carmel Ave)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											
Hooper Rd at Lovett Rd	A	-	A	-	-	A	-	D	-	B	-		
Hooper Rd at Joor Rd	C	B	C	-	B	B	-	C	C	A	B	C	A
Hooper Rd at Shoe Creek Dr	*	*			*			B			-		
Hooper Rd at U-Turn (east of Shoe Creek Dr)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											

Source: CDM Smith, using Synchro, Version 8

* Level of service for a one-way stop control intersection is defined by the level of service of the approaches

** Highway Capacity Manual methodology analyzes intersections with at least one stop control approach

As observed from the tables, with the proposed improvements and the road widening, the study area intersections continue to operate at acceptable LOS during the morning and evening peak hours. Highway Capacity Manual methodology analyzes intersections with at least one stop control approach only, and as such the U-turn only intersections are analyzed visually through *SimTraffic* (companion software to *Synchro*).

4 Traffic Analysis – Design Year 2037

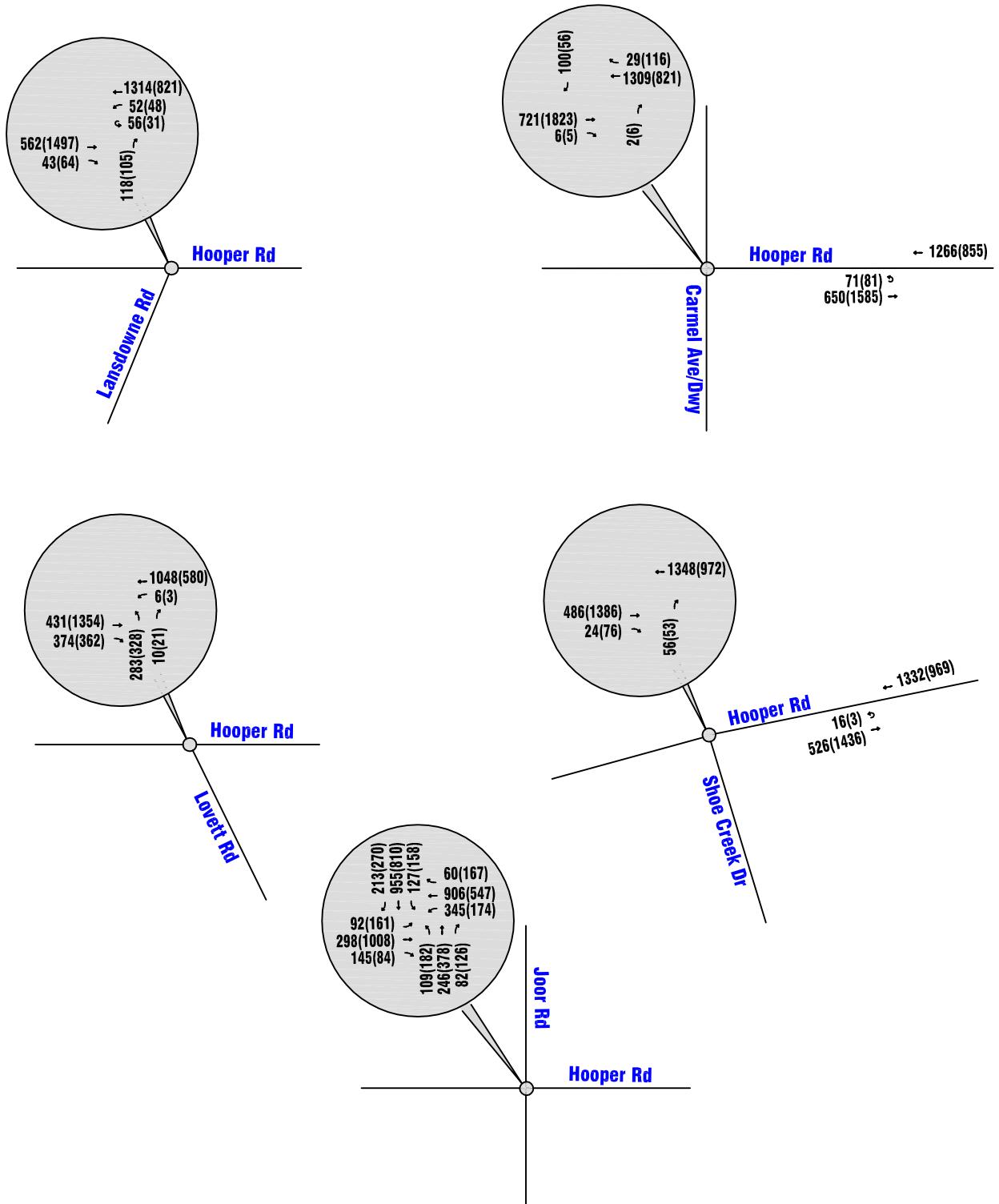
4.1 Traffic Volumes

The design year for the proposed widening of Hooper Road is considered as 2037. Traffic volumes on Hooper Road are assumed to grow annually at the rate of two percent through 2037. **Figure 4** illustrates the projected intersection turning movement counts along Hooper Road.

4.2 Analysis of Proposed Traffic Conditions

Traffic operations analysis was conducted for study area intersections assuming the implementation of proposed recommendations listed in section 3.2 of this report.

Level-of-service (LOS) for the study area intersections are summarized in **Tables 6 and 7** for morning and evening peak hours of a typical weekday respectively. The intersection analyses are conducted assuming the implementation of above listed intersection improvements. Detailed software output for the capacity analyses are provided in **Appendix B**.



Source: CDM Smith, August 2014

DESIGN YEAR 2037 TURNING MOVEMENT VOLUMES

Hooper Road Traffic Study
Baton Rouge, Louisiana

Not to Scale

Table 6 Opening Year 2037 Intersection LOS (Morning Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			B			-		
Hooper Rd at Carmel Ave	*	*			*			B			C		
Hooper Rd at U-Turn (east of Carmel Ave)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											
Hooper Rd at Lovett Rd	B	-	A	-	-	B	-	C	-	B	-		
Hooper Rd at Joor Rd	C	C	C	-	C	C	-	D	C	A	B	C	A
Hooper Rd at Shoe Creek Dr	*	*			*			B			-		
Hooper Rd at U-Turn (east of Shoe Creek Dr)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											

Source: CDM Smith, using Synchro, Version 8

* Level of service for a one-way stop control intersection is defined by the level of service of the approaches

** Highway Capacity Manual methodology analyzes intersections with at least one stop control approach

Table 7 Opening Year 2037 Intersection LOS (Afternoon Peak Hour)

Intersection	Total	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Hooper Rd at Lansdowne Rd	*	*			*			C			-		
Hooper Rd at Carmel Ave	*	*			*			C			B		
Hooper Rd at U-Turn (east of Carmel Ave)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											
Hooper Rd at Lovett Rd	B	-	A	-	-	A	-	D	-	B	-		
Hooper Rd at Joor Rd	D	C	D	-	D	C	-	D	C	A	C	E	A
Hooper Rd at Shoe Creek Dr	*	*			*			C			-		
Hooper Rd at U-Turn (east of Shoe Creek Dr)	**	Traffic operations and queue lengths at U-Turn are acceptable based on review of SimTraffic simulation											

Source: CDM Smith, using Synchro, Version 8

* Level of service for a one-way stop control intersection is defined by the level of service of the approaches

** Highway Capacity Manual methodology analyzes intersections with at least one stop control approach

As observed from the tables, with the proposed improvements and the road widening, the study area intersections continue to operate at acceptable LOS during the morning and evening peak hours. Highway Capacity Manual methodology analyzes intersections with at least one stop control approach only, and as such the U-turn only intersections are analyzed visually through *SimTraffic* (companion software to *Synchro*).

5 Findings and Conclusion

Hooper Road, between Blackwater Road and Sullivan Road, is primarily a two-lane roadway. Hooper Road is proposed to be widened in the near future. This report summarizes the analysis of existing, opening and design year traffic conditions along Hooper Road associated with the proposed widening.

Along with the proposed widening of Hooper Road within the study limits, the following improvements to study area intersections are being recommended:

- Hooper Road at Lansdowne Road
 - Provide westbound left-turn lane along Hooper Road with 50 feet of storage.
 - Allow right-in/right-out only movement for Lansdowne Road.
- Hooper Road at Carmel Avenue
 - Allow right-in/right-out only movement for Carmel Avenue.
- Hooper Road at Lovett Road
 - Provide eastbound right-turn lane with 200 feet of storage.
 - Provide westbound left-turn lane with 150 feet of storage.
 - Operate westbound left-turn with protected/permitted phasing.
 - Provide northbound right-turn with 50 feet of storage.
- Hooper Road at Shoe Creek Drive
 - Allow right-in/right-out only movement for Shoe Creek Drive.
- Six U-turns are provided along Hooper Rd within the study limits – east of Carmel Avenue, east of Lovett Road, east of Idla Drive, west of Joor Road, west of Shoe Creek Drive and east of Shoe Creek Drive.

Appendix A

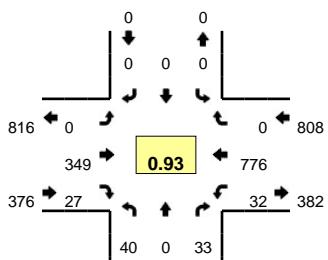
Existing Year Traffic Volumes

Type of peak hour being reported: Intersection Peak

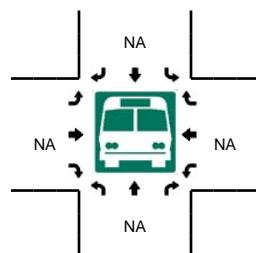
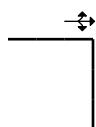
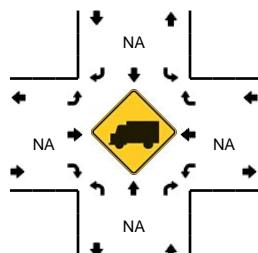
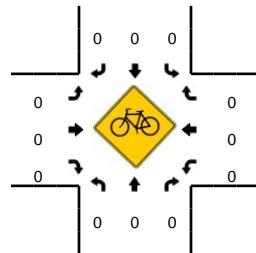
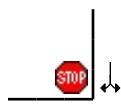
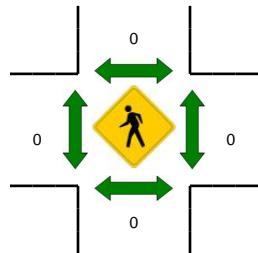
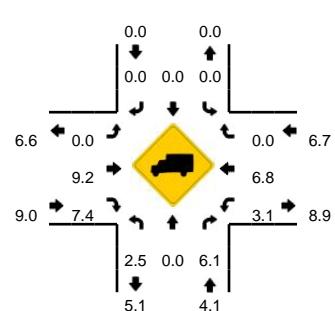
Method for determining peak hour: Total Entering Volume

LOCATION: Lansdowne Rd -- Hooper Rd
CITY/STATE: Baton Rouge , LA

QC JOB #: 10772705
DATE: Tue, Jan 22 2013



Peak-Hour: 6:30 AM -- 7:30 AM
Peak 15-Min: 6:30 AM -- 6:45 AM



15-Min Count Period Beginning At	Lansdowne Rd (Northbound)				Lansdowne Rd (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	14	0	6	0	0	0	0	0	0	108	4	0	4	203	0	0	339	
6:45 AM	7	0	10	0	0	0	0	0	0	82	6	0	5	175	0	0	285	
7:00 AM	11	0	8	0	0	0	0	0	0	67	7	0	11	203	0	0	307	
7:15 AM	8	0	9	0	0	0	0	0	0	92	10	0	12	195	0	0	326	1257
7:30 AM	7	0	9	0	0	0	0	0	0	105	5	0	11	174	0	0	311	1229
7:45 AM	0	0	5	0	0	0	0	0	0	83	8	0	19	183	0	0	298	1242
8:00 AM	16	0	19	0	0	0	0	0	0	76	3	0	8	159	0	0	281	1216
8:15 AM	7	0	10	0	0	0	0	0	0	87	2	0	5	131	0	0	242	1132

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	0	24	0	0	0	0	0	0	432	16	0	16	812	0	0	1356
Heavy Trucks	0	0	4	0	0	0	0	0	0	44	8	0	4	40	0	0	100
Pedestrians	0									0				0			0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

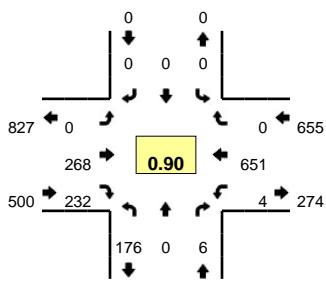
Comments:

Type of peak hour being reported: Intersection Peak

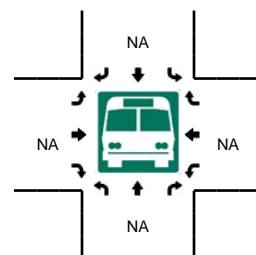
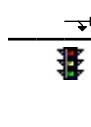
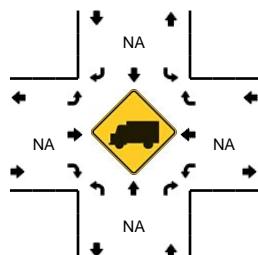
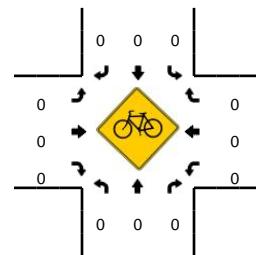
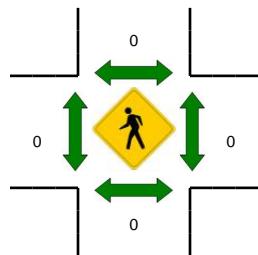
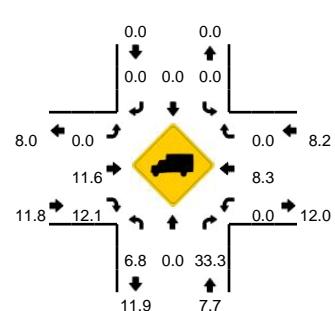
Method for determining peak hour: Total Entering Volume

LOCATION: Lovett Rd -- Hooper Rd
CITY/STATE: Baton Rouge, LA

QC JOB #: 10772703
DATE: Tue, Jan 22 2013



Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 8:00 AM -- 8:15 AM



15-Min Count Period Beginning At	Lovett Rd (Northbound)				Lovett Rd (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	22	0	1	0	0	0	0	0	0	83	38	0	2	175	0	0	321	
6:45 AM	18	0	5	0	0	0	0	0	0	75	39	0	3	162	0	0	302	
7:00 AM	31	0	2	0	0	0	0	0	0	49	40	0	1	192	0	0	315	
7:15 AM	44	0	3	0	0	0	0	0	0	52	68	0	3	157	0	0	327	1265
7:30 AM	40	0	0	0	0	0	0	0	0	64	56	0	1	163	0	0	324	1268
7:45 AM	40	0	2	0	0	0	0	0	0	74	47	0	0	152	0	0	315	1281
8:00 AM	52	0	1	0	0	0	0	0	0	78	61	0	0	179	0	0	371	1337
8:15 AM	33	0	1	0	0	0	0	0	0	94	56	0	2	108	0	0	294	1304

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	208	0	4	0	0	0	0	0	0	312	244	0	0	716	0	0	1484
Heavy Trucks	20	0	0	0	0	0	0	0	0	48	64	0	0	56	0	0	188
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
Railroad																	
Stopped Buses																	

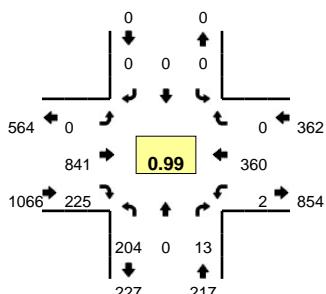
Comments:

Type of peak hour being reported: Intersection Peak

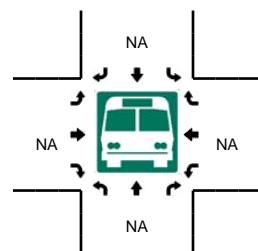
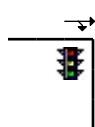
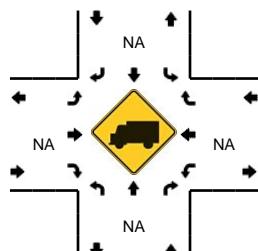
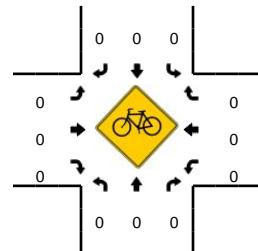
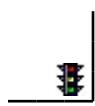
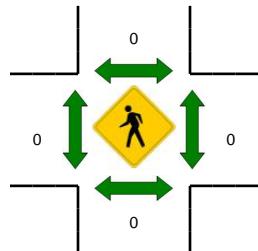
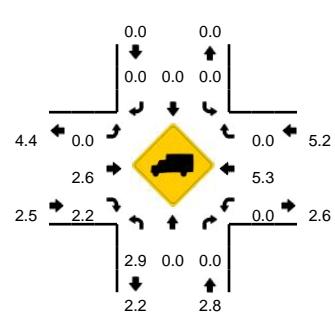
Method for determining peak hour: Total Entering Volume

LOCATION: Lovett Rd -- Hooper Rd
CITY/STATE: Baton Rouge, LA

QC JOB #: 10772704
DATE: Tue, Jan 22 2013



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



15-Min Count Period Beginning At	Lovett Rd (Northbound)				Lovett Rd (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	52	0	4	0	0	0	0	0	0	193	42	0	0	110	0	0	401	
4:45 PM	59	0	2	0	0	0	0	0	0	210	51	0	1	93	0	0	416	
5:00 PM	44	0	4	0	0	0	0	0	0	216	66	0	0	85	0	0	415	
5:15 PM	54	0	2	0	0	0	0	0	0	205	53	0	0	98	0	0	412	
5:30 PM	47	0	5	0	0	0	0	0	0	210	55	0	1	84	0	0	402	1644
5:45 PM	55	0	1	0	0	0	0	0	0	199	50	0	4	90	0	0	399	1628
6:00 PM	43	0	2	0	0	0	0	0	0	144	35	0	3	77	0	0	304	1517
6:15 PM	34	0	0	0	0	0	0	0	0	159	26	0	0	80	0	0	299	1404

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	236	0	8	0	0	0	0	0	0	840	204	0	4	372	0	0	1664
Heavy Trucks	8	0	0	0	0	0	0	0	0	20	4	0	0	8	0	0	40
Pedestrians	0									0				0			0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

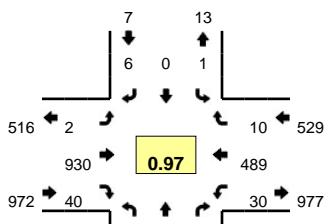
Comments:

Type of peak hour being reported: Intersection Peak

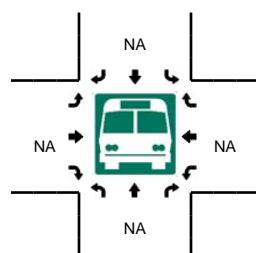
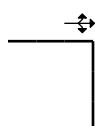
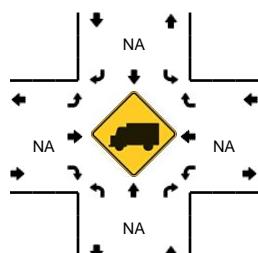
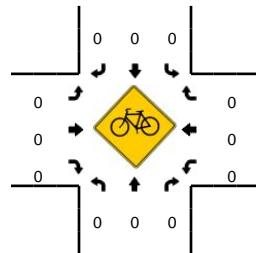
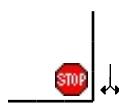
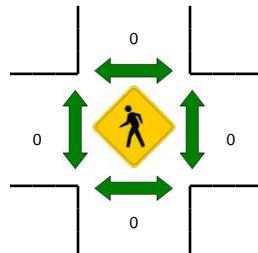
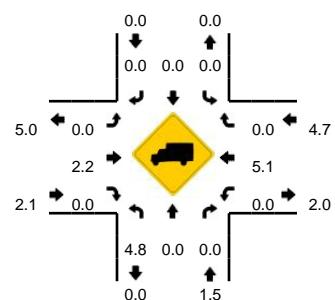
Method for determining peak hour: Total Entering Volume

LOCATION: Lansdowne Rd -- Hooper Rd
CITY/STATE: Baton Rouge , LA

QC JOB #: 10772706
DATE: Tue, Jan 22 2013



Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM



15-Min Count Period Beginning At	Lansdowne Rd (Northbound)				Lansdowne Rd (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:30 PM	3	1	8	0	1	0	1	0	0	238	10	0	8	136	1	0	407		
4:45 PM	9	0	15	0	0	0	0	3	0	1	220	6	0	4	124	2	1	385	
5:00 PM	6	0	13	0	0	0	0	1	0	0	238	9	0	12	111	3	0	393	
5:15 PM	3	0	8	0	0	0	0	1	0	1	234	15	0	4	118	4	1	389	1574
5:30 PM	4	0	1	0	0	0	0	1	0	4	258	15	0	8	105	5	0	401	1568
5:45 PM	4	0	7	0	0	0	0	2	0	1	209	14	0	6	115	3	0	361	1544
6:00 PM	2	0	0	0	0	0	0	3	0	0	175	7	0	6	81	1	0	275	1426
6:15 PM	6	0	5	0	0	0	0	0	0	0	150	9	0	10	92	1	0	273	1310

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	4	32	0	4	0	4	0	0	952	40	0	32	544	4	0	1628
Heavy Trucks	0	0	0	0	0	0	0	0	0	24	0	0	0	16	0	0	40
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

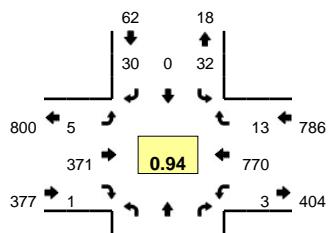
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

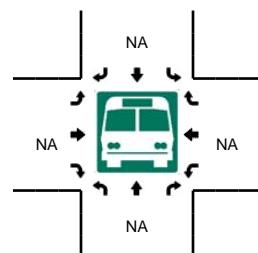
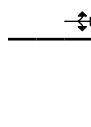
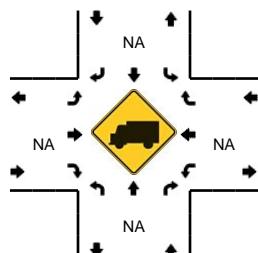
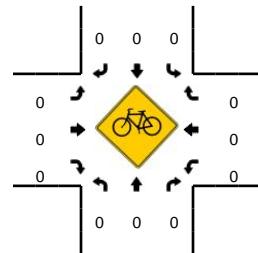
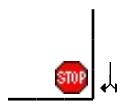
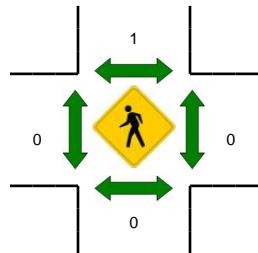
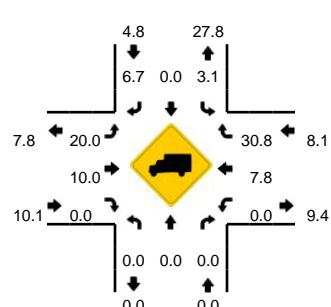
LOCATION: Carmel Ave -- Hooper Rd
CITY/STATE: Baton Rouge, LA

QC JOB #: 10772707

DATE: Tue, Jan 22 2013



Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



15-Min Count Period Beginning At	Carmel Ave (Northbound)				Carmel Ave (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	0	0	0	6	0	12	0	2	112	0	0	0	195	1	0	328	
6:45 AM	0	0	0	0	14	0	7	0	1	91	0	0	0	165	2	0	280	
7:00 AM	0	0	0	0	9	0	5	0	2	70	0	0	0	213	5	0	304	
7:15 AM	0	0	0	0	9	0	7	0	2	94	0	0	1	196	1	0	310	1222
7:30 AM	0	0	0	0	5	0	10	0	0	119	0	0	1	188	4	0	327	1221
7:45 AM	0	0	1	0	9	0	8	0	1	88	1	0	1	173	3	0	285	1226
8:00 AM	0	0	0	0	4	0	11	0	1	93	0	0	1	175	5	0	290	1212
8:15 AM	0	0	0	0	8	0	4	0	0	91	0	0	0	129	4	0	236	1138

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	20	0	40	0	0	476	0	0	4	752	16	0	1308
Heavy Trucks	0	0	0	0	4	0	0	0	0	56	0	0	0	52	0	0	112
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

Comments:

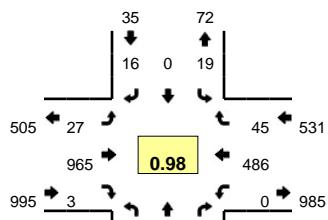
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

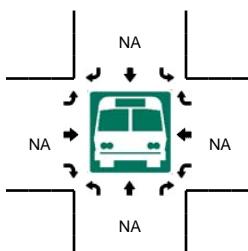
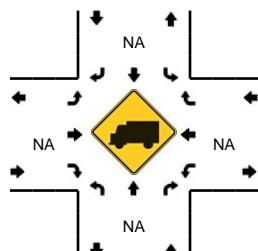
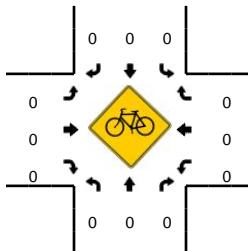
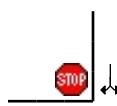
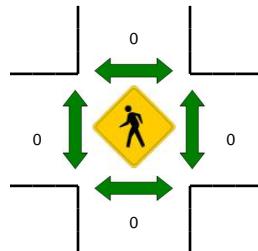
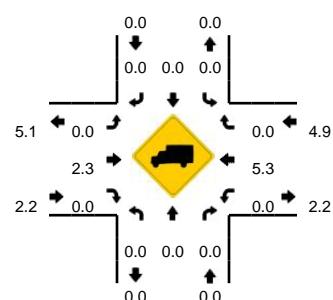
LOCATION: Carmel Ave -- Hooper Rd
CITY/STATE: Baton Rouge, LA

QC JOB #: 10772708

DATE: Tue, Jan 22 2013



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM



15-Min Count Period Beginning At	Carmel Ave (Northbound)				Carmel Ave (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	1	0	0	0	4	0	5	0	9	217	2	0	0	132	17	0	387	
4:45 PM	0	0	1	0	4	0	4	0	5	229	1	0	0	127	14	0	385	
5:00 PM	3	0	0	0	7	0	5	0	6	251	1	0	0	118	7	0	398	
5:15 PM	0	0	0	0	3	0	4	0	8	234	1	0	0	121	12	0	383	1553
5:30 PM	0	0	0	0	5	0	3	0	8	251	0	0	0	120	12	0	399	1565
5:45 PM	0	0	0	0	5	0	6	0	10	219	0	0	0	111	15	0	366	1546
6:00 PM	0	0	0	0	3	0	6	0	6	165	0	0	0	89	14	0	283	1431
6:15 PM	0	0	0	0	7	0	3	0	4	157	0	0	1	98	10	0	280	1328

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	20	0	12	0	32	1004	0	0	0	480	48	0	1596
Heavy Trucks	0	0	0	0	0	0	0	0	0	32	0	0	0	24	0	0	56
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

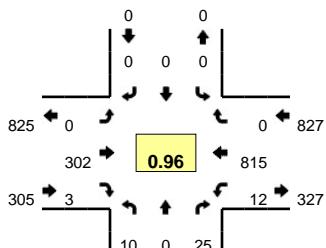
Comments:

Type of peak hour being reported: Intersection Peak

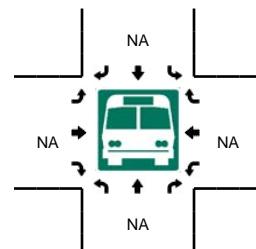
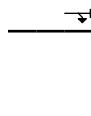
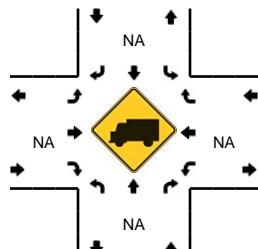
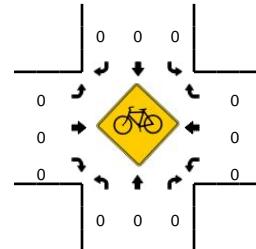
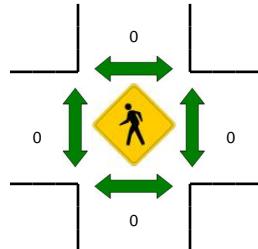
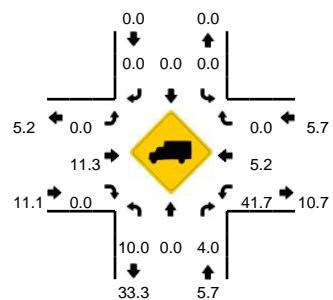
Method for determining peak hour: Total Entering Volume

LOCATION: Shoe Creek Dr -- Hooper Rd
CITY/STATE: Central, LA

QC JOB #: 11593201
DATE: Thu, Dec 12 2013



Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 6:45 AM -- 7:00 AM



15-Min Count Period Beginning At	Shoe Creek Dr (Northbound)				Shoe Creek Dr (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	1	0	9	0	0	0	0	0	0	77	0	0	1	169	0	0	257	
6:45 AM	1	0	11	0	0	0	0	0	0	94	2	0	2	194	0	0	304	
7:00 AM	1	0	7	0	0	0	0	0	0	79	0	0	4	212	0	0	303	
7:15 AM	4	0	3	0	0	0	0	0	0	62	1	0	2	220	0	0	292	
7:30 AM	4	0	4	0	0	0	0	0	0	67	0	0	4	189	0	0	268	1156
7:45 AM	1	0	5	0	0	0	0	0	0	84	0	0	3	163	0	0	256	1119
8:00 AM	1	0	4	0	0	0	0	0	0	68	0	0	3	175	0	0	251	1067
8:15 AM	0	0	4	0	0	0	0	0	0	96	1	0	2	143	0	0	246	1021

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	44	0	0	0	0	0	0	376	8	0	8	776	0	0	1216
Heavy Trucks	0	0	0	0	0	0	0	0	0	32	0	0	4	28	0	0	64
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/23/2014 9:21 AM

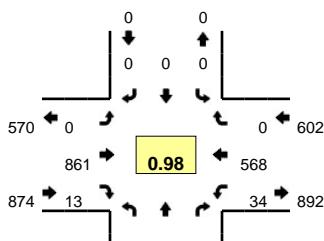
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

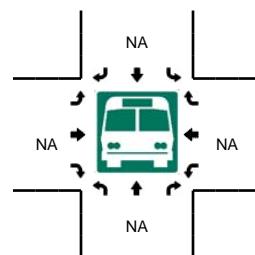
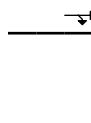
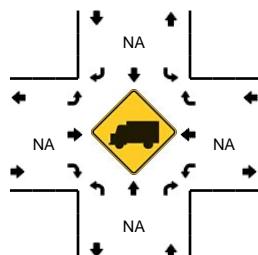
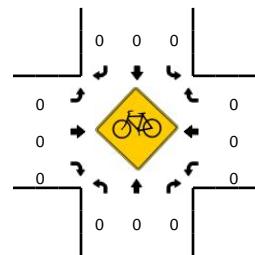
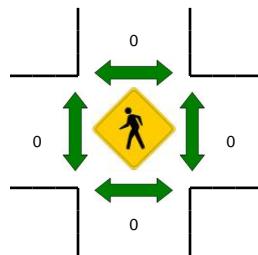
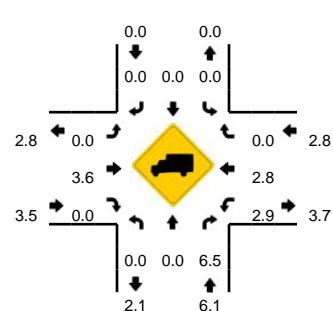
Method for determining peak hour: Total Entering Volume

LOCATION: Shoe Creek Dr -- Hooper Rd
CITY/STATE: Central, LA

QC JOB #: 11593202
DATE: Thu, Dec 12 2013



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM



15-Min Count Period Beginning At	Shoe Creek Dr (Northbound)				Shoe Creek Dr (Southbound)				Hooper Rd (Eastbound)				Hooper Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	2	0	5	0	0	0	0	0	0	237	1	0	8	120	0	0	373	
4:45 PM	1	0	9	0	0	0	0	0	0	215	6	0	10	134	0	0	375	
5:00 PM	0	0	6	0	0	0	0	0	0	208	2	0	8	149	0	0	373	
5:15 PM	0	0	8	0	0	0	0	0	0	217	3	0	8	140	0	0	376	1497
5:30 PM	1	0	8	0	0	0	0	0	0	221	2	0	8	145	0	0	385	1509
5:45 PM	1	0	6	0	0	0	0	0	0	235	2	0	8	115	0	0	367	1501
6:00 PM	0	0	4	0	0	0	0	0	0	208	7	0	7	121	0	0	347	1475
6:15 PM	2	0	11	0	0	0	0	0	0	174	1	0	9	112	0	0	309	1408

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	32	0	0	0	0	0	0	884	8	0	32	580	0	0	1540
Heavy Trucks	0	0	0	0	0	0	0	0	0	32	0	4	16	0	0	52	
Pedestrians	0																0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																	
Stopped Buses																	

Comments:

Appendix B

Synchro Output

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh

1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	349	27	32	776	40	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	9	7	3	7	3	6
Mvmt Flow	375	29	34	834	43	35

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	404	0	1293
Stage 1	-	-	-	-	390
Stage 2	-	-	-	-	903
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	1149	-	179
Stage 1	-	-	-	-	682
Stage 2	-	-	-	-	394
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1149	-	169
Mov Cap-2 Maneuver	-	-	-	-	169
Stage 1	-	-	-	-	682
Stage 2	-	-	-	-	372

Approach	EB	WB		NB
HCM Control Delay, s	0	0.3		25.4
HCM LOS		D		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	254	-	-	1149	-
HCM Lane V/C Ratio	0.309	-	-	0.03	-
HCM Control Delay (s)	25.4	-	-	8.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	371	1	3	770	13	0	0	1	32	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	10	0	0	8	31	0	0	0	3	0	7
Mvmt Flow	5	395	1	3	819	14	0	0	1	34	0	32

Major/Minor	Major1	Major2		Minor1			Minor2					
Conflicting Flow All	833	0	0	396	0	0	1254	1245	395	1238	1238	826
Stage 1	-	-	-	-	-	-	406	406	-	832	832	-
Stage 2	-	-	-	-	-	-	848	839	-	406	406	-
Critical Hdwy	4.3	-	-	4.1	-	-	7.1	6.5	6.2	7.13	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.5	-
Follow-up Hdwy	2.38	-	-	2.2	-	-	3.5	4	3.3	3.527	4	3.363
Pot Cap-1 Maneuver	727	-	-	1174	-	-	150	176	659	152	177	364
Stage 1	-	-	-	-	-	-	626	601	-	362	387	-
Stage 2	-	-	-	-	-	-	359	384	-	620	601	-
Platoon blocked, %	-	-	-	-	-	-						
Mov Cap-1 Maneuver	727	-	-	1174	-	-	135	174	659	150	175	364
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	174	-	150	175	-
Stage 1	-	-	-	-	-	-	620	596	-	359	385	-
Stage 2	-	-	-	-	-	-	326	382	-	613	596	-

Approach	EB	WB			NB			SB		
HCM Control Delay, s	0.1	0			10.5			29.8		
HCM LOS					B			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	659	727	-	-	1174	-	-	210
HCM Lane V/C Ratio	0.002	0.007	-	-	0.003	-	-	0.314
HCM Control Delay (s)	10.5	10	0	-	8.1	0	-	29.8
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	1.3

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1		4	1	1	
Volume (vph)	268	232	4	651	176	6
Satd. Flow (prot)	1590	0	0	1760	1672	0
Flt Permitted				0.998	0.954	
Satd. Flow (perm)	1590	0	0	1756	1672	0
Satd. Flow (RTOR)	120				3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	12%	12%	0%	8%	7%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	556	0	0	727	203	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases				8		
Total Split (s)	39.0		39.0	39.0	21.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effect Green (s)	34.0			34.0	16.0	
Actuated g/C Ratio	0.57			0.57	0.27	
v/c Ratio	0.58			0.73	0.45	
Control Delay	9.4			15.1	22.0	
Queue Delay	0.0			0.0	0.0	
Total Delay	9.4			15.1	22.0	
LOS	A			B	C	
Approach Delay	9.4			15.1	22.0	
Approach LOS	A			B	C	

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 21 (35%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 13.9

Intersection LOS: B

Intersection Capacity Utilization 55.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	57	185	90	214	563	37	68	153	51	79	593	132
Satd. Flow (prot)	1687	3082	0	1770	3313	0	1687	3505	1442	1787	3539	1568
Flt Permitted	0.420			0.469			0.282			0.653		
Satd. Flow (perm)	746	3082	0	874	3313	0	501	3505	1442	1228	3539	1568
Satd. Flow (RTOR)		92			9				164			164
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	7%	15%	4%	2%	8%	8%	7%	3%	12%	1%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	281	0	218	612	0	69	156	52	81	605	135
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	9.0	28.0		14.0	33.0		11.0	29.0	29.0	9.0	27.0	27.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	27.2	23.2		37.0	31.6		30.6	25.8	25.8	27.4	24.2	24.2
Actuated g/C Ratio	0.34	0.29		0.46	0.40		0.38	0.32	0.32	0.34	0.30	0.30
v/c Ratio	0.19	0.29		0.43	0.47		0.25	0.14	0.09	0.18	0.57	0.23
Control Delay	14.3	15.6		16.3	20.0		16.9	20.6	0.3	16.2	26.8	3.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	15.6		16.3	20.0		16.9	20.6	0.3	16.2	26.8	3.6
LOS	B	B		B	C		B	C	A	B	C	A
Approach Delay		15.4			19.0			15.9			22.0	
Approach LOS		B			B			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 19.2

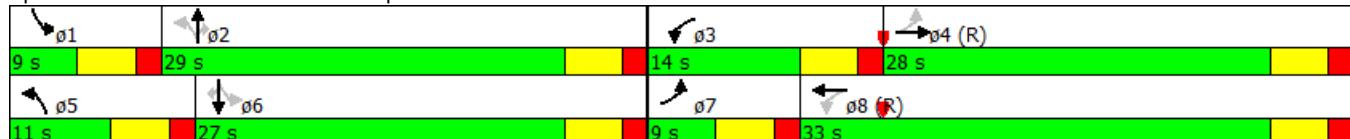
Intersection LOS: B

Intersection Capacity Utilization 56.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh

0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	302	3	12	815	10	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	11	0	42	5	10	4
Mvmt Flow	315	3	12	849	10	26

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	318	0	1190
Stage 1	-	-	-	-	316
Stage 2	-	-	-	-	874
Critical Hdwy	-	-	4.52	-	6.5
Critical Hdwy Stg 1	-	-	-	-	5.5
Critical Hdwy Stg 2	-	-	-	-	5.5
Follow-up Hdwy	-	-	2.578	-	3.59
Pot Cap-1 Maneuver	-	-	1047	-	200
Stage 1	-	-	-	-	721
Stage 2	-	-	-	-	395
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1047	-	195
Mov Cap-2 Maneuver	-	-	-	-	195
Stage 1	-	-	-	-	721
Stage 2	-	-	-	-	386

Approach	EB	WB		NB
HCM Control Delay, s	0	0.1		14.7
HCM LOS				B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	-	-	1047	-
HCM Lane V/C Ratio	0.09	-	-	0.012	-
HCM Control Delay (s)	14.7	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh

1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	930	40	30	489	21	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	0	0	5	5	0
Mvmt Flow	959	41	31	504	22	45

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	1000	0	1545
Stage 1	-	-	-	-	979
Stage 2	-	-	-	-	566
Critical Hdwy	-	-	4.1	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	-	-	2.2	-	3.545
Pot Cap-1 Maneuver	-	-	700	-	124
Stage 1	-	-	-	-	359
Stage 2	-	-	-	-	562
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	700	-	116
Mov Cap-2 Maneuver	-	-	-	-	116
Stage 1	-	-	-	-	359
Stage 2	-	-	-	-	527

Approach	EB	WB		NB
HCM Control Delay, s	0	0.6		31.8
HCM LOS				D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	-	-	700	-
HCM Lane V/C Ratio	0.335	-	-	0.044	-
HCM Control Delay (s)	31.8	-	-	10.4	0
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh

1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	27	965	3	0	486	45	3	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	2	0	0	5	0	0	0	0
Mvmt Flow	28	985	3	0	496	46	3	0	1

Major/Minor	Major1	Major2			Minor1				
Conflicting Flow All	542	0	0	988	0	0	1568	1583	986
Stage 1	-	-	-	-	-	-	1041	1041	-
Stage 2	-	-	-	-	-	-	527	542	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1037	-	-	708	-	-	91	110	303
Stage 1	-	-	-	-	-	-	280	310	-
Stage 2	-	-	-	-	-	-	538	523	-
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1037	-	-	708	-	-	84	103	303
Mov Cap-2 Maneuver	-	-	-	-	-	-	84	103	-
Stage 1	-	-	-	-	-	-	263	291	-
Stage 2	-	-	-	-	-	-	522	523	-

Approach	EB	WB			NB
HCM Control Delay, s	0.2	0			41.4
HCM LOS		E			

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	103	1037	-	-	708	-	-	142
HCM Lane V/C Ratio	0.04	0.027	-	-	-	-	-	0.252
HCM Control Delay (s)	41.4	8.6	0	-	0	-	-	38.7
HCM Lane LOS	E	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.9

2: Carmel Ave/Dwy & Hooper RdIntersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	19	0	16
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	98	98	98
Heavy Vehicles, %	0	0	0
Mvmt Flow	19	0	16

Major/Minor

Major/Minor	Minor2		
Conflicting Flow All	1561	1562	519
Stage 1	519	519	-
Stage 2	1042	1043	-
Critical Hdwy	7.1	6.5	6.2
Critical Hdwy Stg 1	6.1	5.5	-
Critical Hdwy Stg 2	6.1	5.5	-
Follow-up Hdwy	3.5	4	3.3
Pot Cap-1 Maneuver	92	113	561
Stage 1	544	536	-
Stage 2	280	309	-
Platoon blocked, %			
Mov Cap-1 Maneuver	87	106	561
Mov Cap-2 Maneuver	87	106	-
Stage 1	511	536	-
Stage 2	262	290	-

Approach

Approach	SB
HCM Control Delay, s	38.7
HCM LOS	E

Minor Lane/Major Mvmt

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1	2	3	4	5	6
Volume (vph)	841	225	2	360	204	13
Satd. Flow (prot)	1797	0	0	1810	1751	0
Flt Permitted				0.997	0.955	
Satd. Flow (perm)	1797	0	0	1805	1751	0
Satd. Flow (RTOR)	37				4	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	3%	2%	0%	5%	3%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1076	0	0	366	219	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases				8		
Total Split (s)	59.0		59.0	59.0	21.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effct Green (s)	56.2			56.2	13.8	
Actuated g/C Ratio	0.70			0.70	0.17	
v/c Ratio	0.85			0.29	0.72	
Control Delay	17.6			5.5	44.1	
Queue Delay	0.0			0.0	0.0	
Total Delay	17.6			5.5	44.1	
LOS	B			A	D	
Approach Delay	17.6			5.5	44.1	
Approach LOS	B			A	D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 21 (26%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 18.4

Intersection LOS: B

Intersection Capacity Utilization 78.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	100	626	52	108	340	104	113	235	78	98	503	168
Satd. Flow (prot)	1770	3500	0	1752	3390	0	1770	3574	1599	1736	3505	1599
Flt Permitted	0.444			0.258			0.314			0.597		
Satd. Flow (perm)	827	3500	0	476	3390	0	585	3574	1599	1091	3505	1599
Satd. Flow (RTOR)			12			58				164		179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	1%	1%	4%	3%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	721	0	115	473	0	120	250	83	104	535	179
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	9.0	34.0		10.0	35.0		11.0	27.0	27.0	9.0	25.0	25.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	34.2	31.0		35.8	31.8		28.6	23.8	23.8	25.4	22.2	22.2
Actuated g/C Ratio	0.43	0.39		0.45	0.40		0.36	0.30	0.30	0.32	0.28	0.28
v/c Ratio	0.27	0.53		0.39	0.34		0.40	0.24	0.14	0.28	0.55	0.31
Control Delay	13.6	21.0		15.7	16.0		20.7	22.8	0.5	19.3	28.1	5.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	21.0		15.7	16.0		20.7	22.8	0.5	19.3	28.1	5.8
LOS	B	C		B	B		C	C	A	B	C	A
Approach Delay		20.0			16.0			18.2			22.1	
Approach LOS		C			B			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 19.5

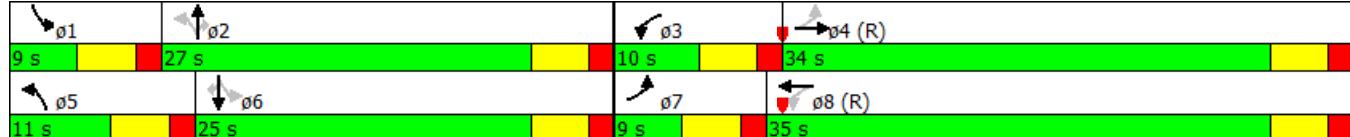
Intersection LOS: B

Intersection Capacity Utilization 61.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	861	13	34	568	2	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	4	0	3	3	0	7
Mvmt Flow	879	13	35	580	2	32

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	892	0	1534
Stage 1	-	-	-	-	885
Stage 2	-	-	-	-	649
Critical Hdwy	-	-	4.13	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.227	-	3.5
Pot Cap-1 Maneuver	-	-	756	-	129
Stage 1	-	-	-	-	407
Stage 2	-	-	-	-	524
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	756	-	120
Mov Cap-2 Maneuver	-	-	-	-	120
Stage 1	-	-	-	-	407
Stage 2	-	-	-	-	488

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	304	-	-	756	-
HCM Lane V/C Ratio	0.111	-	-	0.046	-
HCM Control Delay (s)	18.3	-	-	10	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh

1.1

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Vol, veh/h	349	27	35	32	816	0	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	9	7	2	3	7	3	6
Mvmt Flow	405	31	41	37	948	0	85

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	0	0	521	437	0	1050	218
Stage 1	-	-	-	-	-	421	-
Stage 2	-	-	-	-	-	629	-
Critical Hdwy	-	-	6.44	4.16	-	6.86	7.02
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.52	2.23	-	3.53	3.36
Pot Cap-1 Maneuver	-	-	671	1112	-	221	774
Stage 1	-	-	-	-	-	627	-
Stage 2	-	-	-	-	-	491	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	776	776	-	221	774
Mov Cap-2 Maneuver	-	-	-	-	-	221	-
Stage 1	-	-	-	-	-	627	-
Stage 2	-	-	-	-	-	491	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	774	-	-	776	-
HCM Lane V/C Ratio	0.11	-	-	0.1	-
HCM Control Delay (s)	10.2	-	-	10.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.3	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh	0.6								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	448	4	0	816	18	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	10	0	0	8	31	0	0	0
Mvmt Flow	0	515	5	0	938	21	0	0	1

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	958	0	0	519	0	0	986 1475 260
Stage 1	-	-	-	-	-	-	517 517 -
Stage 2	-	-	-	-	-	-	469 958 -
Critical Hdwy	4.5	-	-	4.1	-	-	7.5 6.5 6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5 5.5 -
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5 5.5 -
Follow-up Hdwy	2.4	-	-	2.2	-	-	3.5 4 3.3
Pot Cap-1 Maneuver	613	-	-	1057	-	-	205 128 745
Stage 1	-	-	-	-	-	-	515 537 -
Stage 2	-	-	-	-	-	-	549 338 -
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	613	-	-	1057	-	-	177 128 745
Mov Cap-2 Maneuver	-	-	-	-	-	-	177 128 -
Stage 1	-	-	-	-	-	-	515 537 -
Stage 2	-	-	-	-	-	-	474 338 -

Approach	EB	WB			NB		
HCM Control Delay, s	0	0			9.8		
HCM LOS					A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	745	613	-	-	1057	-	-	520
HCM Lane V/C Ratio	0.002	-	-	-	-	-	-	0.137
HCM Control Delay (s)	9.8	0	-	-	0	-	-	13
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.5

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	62
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	94	94	94
Heavy Vehicles, %	3	0	7
Mvmt Flow	0	0	71

Major/Minor

Major/Minor	Minor2		
Conflicting Flow All	1205	1467	479
Stage 1	948	948	-
Stage 2	257	519	-
Critical Hdwy	7.56	6.5	7.04
Critical Hdwy Stg 1	6.56	5.5	-
Critical Hdwy Stg 2	6.56	5.5	-
Follow-up Hdwy	3.53	4	3.37
Pot Cap-1 Maneuver	138	129	520
Stage 1	278	342	-
Stage 2	722	536	-
Platoon blocked, %			
Mov Cap-1 Maneuver	138	129	520
Mov Cap-2 Maneuver	138	129	-
Stage 1	278	342	-
Stage 2	721	536	-

Approach

Approach	SB
HCM Control Delay, s	13
HCM LOS	B

Minor Lane/Major Mvmt

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑	↖	↗
Volume (vph)	268	232	4	651	176	6
Satd. Flow (prot)	3223	1442	1805	3343	1687	1214
Flt Permitted			0.489		0.950	
Satd. Flow (perm)	3223	1442	929	3343	1687	1214
Satd. Flow (RTOR)			278			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	12%	12%	0%	8%	7%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	322	278	5	781	211	7
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4			3	8	2
Permitted Phases		4		8		2
Total Split (s)	36.0	36.0	11.0	47.0	33.0	33.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	39.8	39.8	42.0	42.0	28.0	28.0
Actuated g/C Ratio	0.50	0.50	0.52	0.52	0.35	0.35
v/c Ratio	0.20	0.32	0.01	0.45	0.36	0.02
Control Delay	12.5	3.2	9.2	12.8	21.5	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	3.2	9.2	12.8	21.5	10.5
LOS	B	A	A	B	C	B
Approach Delay	8.2			12.8	21.2	
Approach LOS	A			B	C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 44 (55%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 12.2

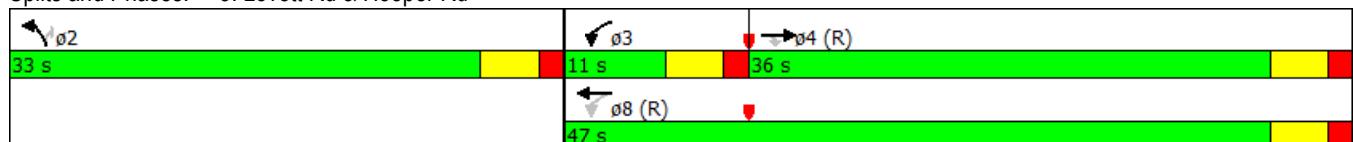
Intersection LOS: B

Intersection Capacity Utilization 38.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	57	185	90	214	563	37	68	153	51	79	593	132
Satd. Flow (prot)	1687	3082	0	1770	3313	0	1687	3505	1442	1787	3539	1568
Flt Permitted	0.379			0.428			0.267			0.645		
Satd. Flow (perm)	673	3082	0	797	3313	0	474	3505	1442	1213	3539	1568
Satd. Flow (RTOR)		97			9				232			232
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	7%	15%	4%	2%	8%	8%	7%	3%	12%	1%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	303	0	236	661	0	75	169	56	87	654	145
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Total Split (s)	10.0	24.0		17.0	31.0		11.0	29.0	29.0	10.0	28.0	28.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	25.1	20.1		36.0	28.0		30.8	26.0	26.0	29.2	25.2	25.2
Actuated g/C Ratio	0.31	0.25		0.45	0.35		0.38	0.32	0.32	0.36	0.32	0.32
v/c Ratio	0.23	0.36		0.48	0.57		0.28	0.15	0.09	0.18	0.59	0.22
Control Delay	15.8	18.3		17.7	23.8		16.8	20.6	0.3	15.3	26.5	1.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	18.3		17.7	23.8		16.8	20.6	0.3	15.3	26.5	1.3
LOS	B	B		B	C		B	C	A	B	C	A
Approach Delay		17.8			22.2			15.9			21.2	
Approach LOS		B			C			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 20.4

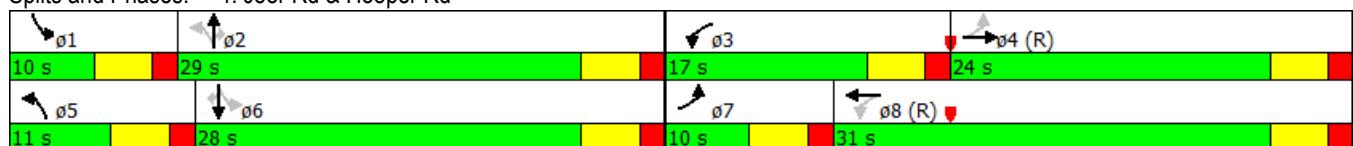
Intersection LOS: C

Intersection Capacity Utilization 59.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	302	15	0	837	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	11	0	42	5	10	4
Mvmt Flow	340	17	0	942	0	39

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	357	0	819
Stage 1	-	-	-	-	348
Stage 2	-	-	-	-	471
Critical Hdwy	-	-	4.94	-	7
Critical Hdwy Stg 1	-	-	-	-	6
Critical Hdwy Stg 2	-	-	-	-	6
Follow-up Hdwy	-	-	2.62	-	3.6
Pot Cap-1 Maneuver	-	-	956	-	298
Stage 1	-	-	-	-	663
Stage 2	-	-	-	-	572
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	956	-	298
Mov Cap-2 Maneuver	-	-	-	-	298
Stage 1	-	-	-	-	663
Stage 2	-	-	-	-	572

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	828	-	-	956	-
HCM Lane V/C Ratio	0.048	-	-	-	-
HCM Control Delay (s)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh

1

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Vol, veh/h	930	40	19	30	510	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	97	97	92	97	97	97	97
Heavy Vehicles, %	2	0	2	0	5	5	0
Mvmt Flow	1035	45	22	33	568	0	72

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	0	0	1152	1080	0	1453	540
Stage 1	-	-	-	-	-	1058	-
Stage 2	-	-	-	-	-	395	-
Critical Hdwy	-	-	6.44	4.1	-	6.9	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.52	2.2	-	3.55	3.3
Pot Cap-1 Maneuver	-	-	265	653	-	118	491
Stage 1	-	-	-	-	-	288	-
Stage 2	-	-	-	-	-	641	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	376	376	-	118	491
Mov Cap-2 Maneuver	-	-	-	-	-	118	-
Stage 1	-	-	-	-	-	288	-
Stage 2	-	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	491	-	-	376	-
HCM Lane V/C Ratio	0.147	-	-	0.148	-
HCM Control Delay (s)	13.6	-	-	16.2	-
HCM Lane LOS	B	-	-	C	-
HCM 95th %tile Q(veh)	0.5	-	-	0.5	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	1032	3	0	510	72	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	2	0	0	5	0	0	0	0
Mvmt Flow	0	1137	3	0	562	79	0	0	4

Major/Minor	Major1		Major2		Minor1				
Conflicting Flow All	641	0	0	1141	0	0	1420	1780	570
Stage 1	-	-	-	-	-	-	1139	1139	-
Stage 2	-	-	-	-	-	-	281	641	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	953	-	-	620	-	-	98	83	470
Stage 1	-	-	-	-	-	-	218	278	-
Stage 2	-	-	-	-	-	-	708	473	-
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	953	-	-	620	-	-	92	83	470
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	83	-
Stage 1	-	-	-	-	-	-	218	278	-
Stage 2	-	-	-	-	-	-	668	473	-

Approach	EB		WB		NB
HCM Control Delay, s	0		0		12.7
HCM LOS					B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	470	953	-	-	620	-	-	681
HCM Lane V/C Ratio	0.009	-	-	-	-	-	-	0.057
HCM Control Delay (s)	12.7	0	-	-	0	-	-	10.6
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	35
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	98	98	98
Heavy Vehicles, %	0	0	0
Mvmt Flow	0	0	39

Major/Minor

Major/Minor	Minor2		
Conflicting Flow All	1171	1743	321
Stage 1	602	602	-
Stage 2	569	1141	-
Critical Hdwy	7.5	6.5	6.9
Critical Hdwy Stg 1	6.5	5.5	-
Critical Hdwy Stg 2	6.5	5.5	-
Follow-up Hdwy	3.5	4	3.3
Pot Cap-1 Maneuver	150	88	681
Stage 1	458	492	-
Stage 2	479	278	-
Platoon blocked, %			
Mov Cap-1 Maneuver	149	88	681
Mov Cap-2 Maneuver	149	88	-
Stage 1	458	492	-
Stage 2	475	278	-

Approach

Approach	SB
HCM Control Delay, s	10.6
HCM LOS	B

Minor Lane/Major Mvmt

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑	↖	↗
Volume (vph)	841	225	2	360	204	13
Satd. Flow (prot)	3505	1583	1805	3438	1752	1615
Flt Permitted			0.290		0.950	
Satd. Flow (perm)	3505	1583	551	3438	1752	1615
Satd. Flow (RTOR)			245			11
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Growth Factor	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	3%	2%	0%	5%	3%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	917	245	2	393	223	14
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Total Split (s)	59.0	59.0	59.0	59.0	21.0	21.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	56.0	56.0	56.0	56.0	14.0	14.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.18	0.18
v/c Ratio	0.37	0.21	0.01	0.16	0.73	0.05
Control Delay	5.7	1.1	4.5	4.5	45.2	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	1.1	4.5	4.5	45.2	16.3
LOS	A	A	A	A	D	B
Approach Delay	4.7			4.5	43.5	
Approach LOS	A			A	D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 21 (26%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 45.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	100	626	52	108	340	104	113	235	78	98	503	168
Satd. Flow (prot)	1770	3497	0	1752	3390	0	1770	3574	1599	1736	3505	1599
Flt Permitted	0.416			0.227			0.282			0.585		
Satd. Flow (perm)	775	3497	0	419	3390	0	525	3574	1599	1069	3505	1599
Satd. Flow (RTOR)		12			58				164			193
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	1%	1%	4%	3%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	779	0	124	510	0	130	270	90	113	578	193
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	9.0	34.0		10.0	35.0		11.0	27.0	27.0	9.0	25.0	25.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	34.2	31.0		35.8	31.8		28.6	23.8	23.8	25.4	22.2	22.2
Actuated g/C Ratio	0.43	0.39		0.45	0.40		0.36	0.30	0.30	0.32	0.28	0.28
v/c Ratio	0.30	0.57		0.46	0.37		0.46	0.25	0.15	0.30	0.59	0.33
Control Delay	14.2	21.7		17.6	16.5		22.3	23.0	0.9	19.8	28.9	5.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	21.7		17.6	16.5		22.3	23.0	0.9	19.8	28.9	5.7
LOS	B	C		B	B		C	C	A	B	C	A
Approach Delay		20.7			16.7			18.7			22.7	
Approach LOS		C			B			B			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 20.1

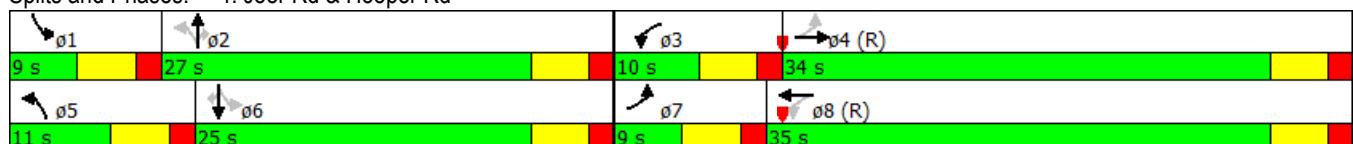
Intersection LOS: C

Intersection Capacity Utilization 65.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	861	47	0	604	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	4	0	3	3	0	7
Mvmt Flow	949	52	0	666	0	36

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	1001	0	1308
Stage 1	-	-	-	-	975
Stage 2	-	-	-	-	333
Critical Hdwy	-	-	4.16	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	-	-	2.23	-	3.5
Pot Cap-1 Maneuver	-	-	681	-	154
Stage 1	-	-	-	-	331
Stage 2	-	-	-	-	704
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	681	-	154
Mov Cap-2 Maneuver	-	-	-	-	154
Stage 1	-	-	-	-	331
Stage 2	-	-	-	-	704

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	503	-	-	681	-
HCM Lane V/C Ratio	0.072	-	-	-	-
HCM Control Delay (s)	12.7	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh 1.3

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Vol, veh/h	349	27	35	32	816	0	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	92	93	93	93	93
Heavy Vehicles, %	9	7	2	3	7	3	6
Mvmt Flow	604	47	61	55	1413	0	126

Major/Minor	Major1	Major2			Minor1	
Conflicting Flow All	0	0	777	651	0	1568
Stage 1	-	-	-	-	-	628
Stage 2	-	-	-	-	-	940
Critical Hdwy	-	-	6.44	4.16	-	6.86
Critical Hdwy Stg 1	-	-	-	-	-	5.86
Critical Hdwy Stg 2	-	-	-	-	-	5.86
Follow-up Hdwy	-	-	2.52	2.23	-	3.53
Pot Cap-1 Maneuver	-	-	461	925	-	101
Stage 1	-	-	-	-	-	491
Stage 2	-	-	-	-	-	338
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	557	557	-	101
Mov Cap-2 Maneuver	-	-	-	-	-	101
Stage 1	-	-	-	-	-	491
Stage 2	-	-	-	-	-	338

Approach	EB	WB	NB
HCM Control Delay, s	0	1	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	659	-	-	557	-
HCM Lane V/C Ratio	0.192	-	-	0.209	-
HCM Control Delay (s)	11.8	-	-	13.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.7	-	-	0.8	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh	0.9								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	448	4	0	813	18	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	10	0	0	8	31	0	0	0
Mvmt Flow	0	767	7	0	1392	31	0	0	2

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	1423	0	0	774	0	0	1467 2194 387
Stage 1	-	-	-	-	-	-	771 771 -
Stage 2	-	-	-	-	-	-	696 1423 -
Critical Hdwy	4.5	-	-	4.1	-	-	7.5 6.5 6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5 5.5 -
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5 5.5 -
Follow-up Hdwy	2.4	-	-	2.2	-	-	3.5 4 3.3
Pot Cap-1 Maneuver	392	-	-	851	-	-	91 46 617
Stage 1	-	-	-	-	-	-	363 413 -
Stage 2	-	-	-	-	-	-	403 204 -
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	392	-	-	851	-	-	64 46 617
Mov Cap-2 Maneuver	-	-	-	-	-	-	64 46 -
Stage 1	-	-	-	-	-	-	363 413 -
Stage 2	-	-	-	-	-	-	285 204 -

Approach	EB	WB			NB		
HCM Control Delay, s	0	0			10.9		
HCM LOS	B	B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	617	392	-	-	851	-	-	364
HCM Lane V/C Ratio	0.003	-	-	-	-	-	-	0.292
HCM Control Delay (s)	10.9	0	-	-	0	-	-	18.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	1.2

2: Carmel Ave/Dwy & Hooper RdIntersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	62
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	94	94	94
Heavy Vehicles, %	3	0	7
Mvmt Flow	0	0	106

Major/Minor

Major/Minor	Minor2		
Conflicting Flow All	1792	2182	712
Stage 1	1408	1408	-
Stage 2	384	774	-
Critical Hdwy	7.56	6.5	7.04
Critical Hdwy Stg 1	6.56	5.5	-
Critical Hdwy Stg 2	6.56	5.5	-
Follow-up Hdwy	3.53	4	3.37
Pot Cap-1 Maneuver	50	47	364
Stage 1	145	207	-
Stage 2	608	411	-
Platoon blocked, %			
Mov Cap-1 Maneuver	50	47	364
Mov Cap-2 Maneuver	50	47	-
Stage 1	145	207	-
Stage 2	606	411	-

Approach

Approach	SB
HCM Control Delay, s	18.9
HCM LOS	C

Minor Lane/Major Mvmt

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑	↖	↗
Volume (vph)	268	232	4	651	176	6
Satd. Flow (prot)	3223	1442	1805	3343	1687	1214
Flt Permitted			0.399		0.950	
Satd. Flow (perm)	3223	1442	758	3343	1687	1214
Satd. Flow (RTOR)			415			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	12%	12%	0%	8%	7%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	479	415	7	1165	315	11
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4			3	8	2
Permitted Phases		4		8		2
Total Split (s)	39.0	39.0	9.0	48.0	32.0	32.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	41.2	41.2	43.0	43.0	27.0	27.0
Actuated g/C Ratio	0.52	0.52	0.54	0.54	0.34	0.34
v/c Ratio	0.29	0.44	0.02	0.65	0.55	0.03
Control Delay	12.3	3.1	8.7	15.3	26.1	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	3.1	8.7	15.3	26.1	13.0
LOS	B	A	A	B	C	B
Approach Delay	8.0			15.2	25.7	
Approach LOS	A			B	C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 14.0

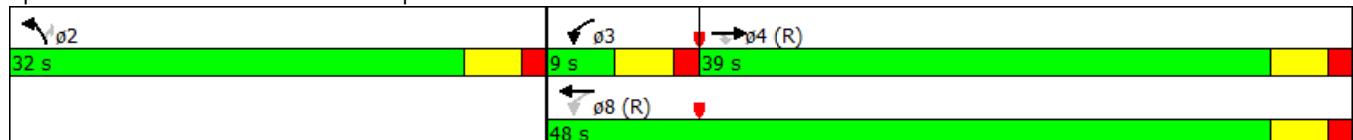
Intersection LOS: B

Intersection Capacity Utilization 53.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



Future Year 2037

Timing Plan: AM Peak Hour

4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	57	185	90	214	563	37	68	153	51	79	593	132
Satd. Flow (prot)	1687	3082	0	1770	3313	0	1687	3505	1442	1787	3539	1568
Flt Permitted	0.231			0.281			0.159			0.561		
Satd. Flow (perm)	410	3082	0	523	3313	0	282	3505	1442	1055	3539	1568
Satd. Flow (RTOR)		95				9				232		232
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	7%	15%	4%	2%	8%	8%	7%	3%	12%	1%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	452	0	352	986	0	112	251	84	130	974	217
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	9.0	23.0		18.0	32.0		9.0	28.0	28.0	11.0	30.0	30.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	22.3	18.3		36.0	28.8		28.4	25.2	25.2	31.6	26.8	26.8
Actuated g/C Ratio	0.28	0.23		0.45	0.36		0.36	0.32	0.32	0.40	0.34	0.34
v/c Ratio	0.53	0.58		0.81	0.82		0.66	0.23	0.14	0.28	0.82	0.32
Control Delay	27.1	25.0		32.6	31.1		37.3	21.9	0.5	16.2	32.5	4.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	25.0		32.6	31.1		37.3	21.9	0.5	16.2	32.5	4.0
LOS	C	C		C	C		D	C	A	B	C	A
Approach Delay		25.4			31.5			21.7			26.2	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 27.5

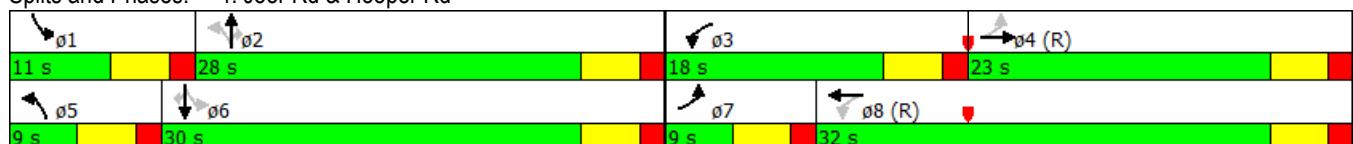
Intersection LOS: C

Intersection Capacity Utilization 81.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	302	15	0	837	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	11	0	42	5	10	4
Mvmt Flow	506	25	0	1404	0	59

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	532	0	1221
Stage 1	-	-	-	-	519
Stage 2	-	-	-	-	702
Critical Hdwy	-	-	4.94	-	7
Critical Hdwy Stg 1	-	-	-	-	6
Critical Hdwy Stg 2	-	-	-	-	6
Follow-up Hdwy	-	-	2.62	-	3.6
Pot Cap-1 Maneuver	-	-	799	-	161
Stage 1	-	-	-	-	540
Stage 2	-	-	-	-	432
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	799	-	161
Mov Cap-2 Maneuver	-	-	-	-	161
Stage 1	-	-	-	-	540
Stage 2	-	-	-	-	432

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	726	-	-	799	-
HCM Lane V/C Ratio	0.081	-	-	-	-
HCM Control Delay (s)	10.4	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

1: Lansdowne Rd & Hooper Rd

Intersection

Int Delay, s/veh

2.2

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Vol, veh/h	930	40	19	30	510	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	97	97	92	97	97	97	97
Heavy Vehicles, %	2	0	2	0	5	5	0
Mvmt Flow	1544	66	33	50	846	0	108

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	0	0	1718	1610	0	2166	805
Stage 1	-	-	-	-	-	1577	-
Stage 2	-	-	-	-	-	589	-
Critical Hdwy	-	-	6.44	4.1	-	6.9	6.9
Critical Hdwy Stg 1	-	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.52	2.2	-	3.55	3.3
Pot Cap-1 Maneuver	-	-	114	411	-	39	330
Stage 1	-	-	-	-	-	151	-
Stage 2	-	-	-	-	-	509	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	172	172	-	39	330
Mov Cap-2 Maneuver	-	-	-	-	-	39	-
Stage 1	-	-	-	-	-	151	-
Stage 2	-	-	-	-	-	509	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	330	-	-	172	-
HCM Lane V/C Ratio	0.327	-	-	0.483	-
HCM Control Delay (s)	21.1	-	-	44	-
HCM Lane LOS	C	-	-	E	-
HCM 95th %tile Q(veh)	1.4	-	-	2.3	-

2: Carmel Ave/Dwy & Hooper Rd

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	1132	3	0	510	72	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	2	0	0	5	0	0	0	0
Mvmt Flow	0	1860	5	0	838	118	0	0	7

Major/Minor	Major1	Major2			Minor1				
Conflicting Flow All	956	0	0	1865	0	0	2281	2818	932
Stage 1	-	-	-	-	-	-	1862	1862	-
Stage 2	-	-	-	-	-	-	419	956	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	727	-	-	328	-	-	22	18	272
Stage 1	-	-	-	-	-	-	77	124	-
Stage 2	-	-	-	-	-	-	588	339	-
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	727	-	-	328	-	-	20	18	272
Mov Cap-2 Maneuver	-	-	-	-	-	-	20	18	-
Stage 1	-	-	-	-	-	-	77	124	-
Stage 2	-	-	-	-	-	-	525	339	-

Approach	EB	WB			NB		
HCM Control Delay, s	0				0		18.6
HCM LOS							C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	272	727	-	-	328	-	-	539
HCM Lane V/C Ratio	0.024	-	-	-	-	-	-	0.107
HCM Control Delay (s)	18.6	0	-	-	0	-	-	12.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.4

2: Carmel Ave/Dwy & Hooper RdIntersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	35
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	98	98	98
Heavy Vehicles, %	0	0	0
Mvmt Flow	0	0	58

Major/Minor

Major/Minor	Minor2		
Conflicting Flow All	1827	2762	478
Stage 1	897	897	-
Stage 2	930	1865	-
Critical Hdwy	7.5	6.5	6.9
Critical Hdwy Stg 1	6.5	5.5	-
Critical Hdwy Stg 2	6.5	5.5	-
Follow-up Hdwy	3.5	4	3.3
Pot Cap-1 Maneuver	49	20	539
Stage 1	305	361	-
Stage 2	291	124	-
Platoon blocked, %			
Mov Cap-1 Maneuver	48	20	539
Mov Cap-2 Maneuver	48	20	-
Stage 1	305	361	-
Stage 2	284	124	-

Approach

Approach	SB
HCM Control Delay, s	12.5
HCM LOS	B

Minor Lane/Major Mvmt

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑	↖	↗
Volume (vph)	841	225	2	360	204	13
Satd. Flow (prot)	3505	1583	1805	3438	1752	1615
Flt Permitted				0.139		0.950
Satd. Flow (perm)	3505	1583	264	3438	1752	1615
Satd. Flow (RTOR)			366			12
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Growth Factor	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	3%	2%	0%	5%	3%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1368	366	3	585	332	21
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Total Split (s)	50.0	50.0	50.0	50.0	30.0	30.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	50.2	50.2	50.2	50.2	19.8	19.8
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.25	0.25
v/c Ratio	0.62	0.32	0.02	0.27	0.76	0.05
Control Delay	11.5	1.8	8.0	7.8	39.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	1.8	8.0	7.8	39.5	13.7
LOS	B	A	A	A	D	B
Approach Delay	9.5			7.8	37.9	
Approach LOS	A			A	D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 21 (26%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 12.9

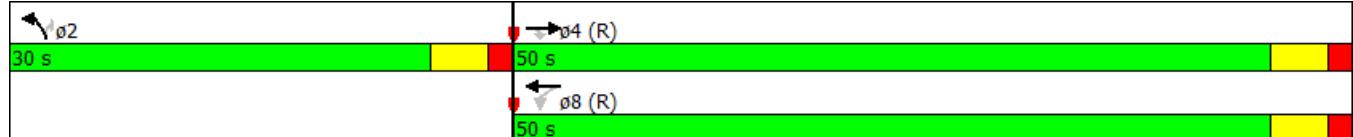
Intersection LOS: B

Intersection Capacity Utilization 64.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



Future Year 2037

Timing Plan: PM Peak Hour

4: Joor Rd & Hooper Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	↑
Volume (vph)	100	626	52	108	340	104	113	235	78	98	503	168
Satd. Flow (prot)	1770	3500	0	1752	3390	0	1770	3574	1599	1736	3505	1599
Flt Permitted	0.227			0.148			0.217			0.392		
Satd. Flow (perm)	423	3500	0	273	3390	0	404	3574	1599	716	3505	1599
Satd. Flow (RTOR)		12			54				164			269
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	1%	1%	4%	3%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	1161	0	185	760	0	194	402	134	168	862	288
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Total Split (s)	11.0	32.0		11.0	32.0		12.0	23.0	23.0	14.0	25.0	25.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	33.0	27.0		33.0	27.0		25.4	18.4	18.4	28.6	20.0	20.0
Actuated g/C Ratio	0.41	0.34		0.41	0.34		0.32	0.23	0.23	0.36	0.25	0.25
v/c Ratio	0.62	0.98		0.83	0.64		0.79	0.49	0.27	0.46	0.98	0.48
Control Delay	24.2	48.5		46.3	23.8		42.3	29.3	4.4	20.5	58.4	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	48.5		46.3	23.8		42.3	29.3	4.4	20.5	58.4	7.3
LOS	C	D		D	C		D	C	A	C	E	A
Approach Delay		45.4			28.2			28.2			42.4	
Approach LOS		D			C			C			D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 37.8

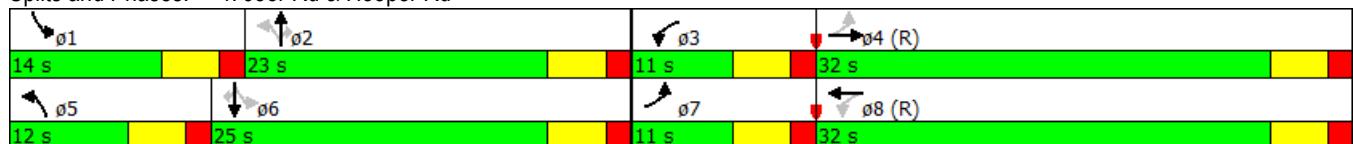
Intersection LOS: D

Intersection Capacity Utilization 89.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: Joor Rd & Hooper Rd



5: Shoe Creek Dr & Hooper Rd

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	861	47	0	604	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	4	0	3	3	0	7
Mvmt Flow	1414	77	0	992	0	54

Major/Minor	Major1	Major2		Minor1	
Conflicting Flow All	0	0	1492	0	1949
Stage 1	-	-	-	-	1453
Stage 2	-	-	-	-	496
Critical Hdwy	-	-	4.16	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	-	-	2.23	-	3.5
Pot Cap-1 Maneuver	-	-	441	-	58
Stage 1	-	-	-	-	185
Stage 2	-	-	-	-	583
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	441	-	58
Mov Cap-2 Maneuver	-	-	-	-	58
Stage 1	-	-	-	-	185
Stage 2	-	-	-	-	583

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	345	-	-	441	-
HCM Lane V/C Ratio	0.157	-	-	-	-
HCM Control Delay (s)	17.4	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-



CDM
Smith[®]
cdmsmith.com



Memorandum

To: Greg Sepeda, PE – Sigma Consulting Group, Inc.

From: Praveen Pasumarthy, PE – CDM Smith

Date: December 21, 2015

Subject: Hooper Road Traffic Study – Additional Analysis

Hooper Road Traffic Study, conducted in 2015, summarized the analysis of existing, opening and design year traffic conditions along Hooper Road as a part of the Stage 1 Environmental Services Study.

The following comment was received for the traffic study and this memorandum addresses this comment:

- What is the projected level of service at the intersection of Hooper Road at Lovett Road for opening year and the design year without the proposed improvements?

Hooper Road at Lovett Road – Opening Year 2017 Traffic Operations

Table 1 summarizes level of service for the intersection of Hooper Road at Lovett Road for morning and evening peak hours without the proposed improvements.

Table 1 Opening Year 2017 Intersection LOS (without proposed improvements)

Hooper Road at Lovett Road

Intersection	Total	Eastbound			Westbound			Northbound	Southbound		
		L	T	R	L	T	R		L	T	R
Morning Peak Hour	B	-	B	-	-	B	-	C	-	-	-
Evening Peak Hour	B	-	A	-	-	A	-	D	-	-	-

Source: CDM Smith, using Synchro, Version 9

Table 2 summarizes the intersection queues projected for both scenarios – with and without improvements. As it can be seen, without proposed improvements, the queues are projected to be higher.

Greg Sepeda, PE
 December 23, 2015
 Page 2

Table 2 Opening Year 2017 Intersection Queues (with and without proposed improvements)

Hooper Road at Lovett Road

Intersection	Eastbound		Westbound	Northbound
	Right Turn		Left Turn	Right Turn
Morning Peak Hour	78 ft/120 ft		18 ft/198 ft	44 ft/151 ft
Evening Peak Hour	60 ft/130 ft		14 ft/92 ft	33 ft/194 ft

Source: CDM Smith, using Synchro, Version 9

Note: The above table shows the 95th percentile queues for two scenarios – with/without improvements

Hooper Road at Lovett Road – Design Year 2037 Traffic Operations

Table 3 summarizes level of service for the intersection of Hooper Road at Lovett Road for morning and evening peak hours without the proposed improvements.

Table 3 Design Year 2037 Intersection LOS (without proposed improvements)

Hooper Road at Lovett Road

Intersection	Total	Eastbound			Westbound			Northbound	Southbound		
		L	T	R	L	T	R		L	T	R
Morning Peak Hour	B	-	A	-	-	B	-	C	-	-	-
Evening Peak Hour	B	-	B	-	-	A	-	D	-	-	-

Source: CDM Smith, using Synchro, Version 9

Table 4 summarizes the intersection queues projected for both scenarios – with and without improvements. As it can be seen, without proposed improvements, the queues are projected to be higher.

Table 4 Design Year 2037 Intersection Queues (with and without proposed improvements)

Hooper Road at Lovett Road

Intersection	Eastbound		Westbound	Northbound
	Right Turn		Left Turn	Right Turn
Morning Peak Hour	93 ft/192 ft		26 ft/250 ft	46 ft/235 ft
Evening Peak Hour	81 ft/353 ft		12 ft/202 ft	43 ft/288 ft

Source: CDM Smith, using Synchro, Version 9

Note: The above table shows the 95th percentile queues for two scenarios – with/without improvements

Software output for the above capacity analyses are provided as an attachment.

We trust the above summary addresses your comment. If you need additional clarification, please do not hesitate to contact us.

Opening Year 2017 without Improvements

AM Peak Hour

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↑	↑	
Traffic Volume (vph)	268	232	4	651	176	6
Future Volume (vph)	268	232	4	651	176	6
Satd. Flow (prot)	2998	0	0	3344	1674	0
Flt Permitted				0.953	0.954	
Satd. Flow (perm)	2998	0	0	3187	1674	0
Satd. Flow (RTOR)	278				2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	12%	12%	0%	8%	7%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	600	0	0	786	218	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	4			3	8	2
Permitted Phases				8		
Total Split (s)	36.0		11.0	47.0	33.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effect Green (s)	31.5			42.0	28.0	
Actuated g/C Ratio	0.39			0.52	0.35	
v/c Ratio	0.44			0.47	0.37	
Control Delay	10.3			13.0	21.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	10.3			13.0	21.6	
LOS	B			B	C	
Approach Delay	10.3			13.0	21.6	
Approach LOS	B			B	C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 44 (55%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 13.1

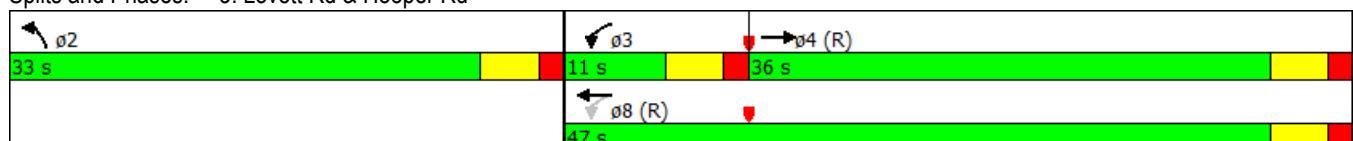
Intersection LOS: B

Intersection Capacity Utilization 41.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



Opening Year 2017 without Improvements

3: Lovett Rd & Hooper Rd

PM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↑	↑	
Traffic Volume (vph)	841	225	2	360	204	13
Future Volume (vph)	841	225	2	360	204	13
Satd. Flow (prot)	3400	0	0	3439	1751	0
Flt Permitted				0.952	0.955	
Satd. Flow (perm)	3400	0	0	3274	1751	0
Satd. Flow (RTOR)	65				4	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Growth Factor	108%	108%	108%	108%	108%	108%
Heavy Vehicles (%)	3%	2%	0%	5%	3%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1162	0	0	395	237	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Total Split (s)	48.0		11.0	59.0	21.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effect Green (s)	55.7			55.7	14.3	
Actuated g/C Ratio	0.70			0.70	0.18	
v/c Ratio	0.49			0.17	0.75	
Control Delay	6.3			4.7	45.9	
Queue Delay	0.0			0.0	0.0	
Total Delay	6.3			4.7	45.9	
LOS	A			A	D	
Approach Delay	6.3			4.7	45.9	
Approach LOS	A			A	D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 11.2

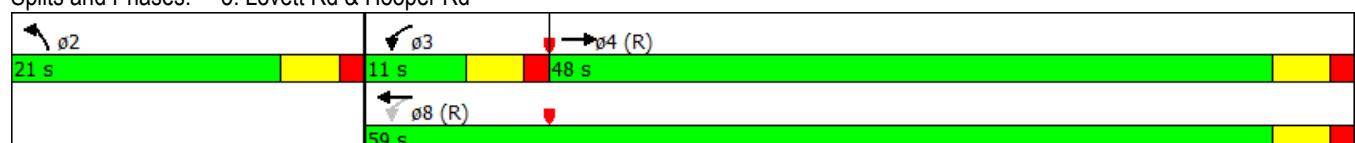
Intersection LOS: B

Intersection Capacity Utilization 54.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



Future Year 2037 without Improvements

AM Peak Hour

3: Lovett Rd & Hooper Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↑	↑	
Traffic Volume (vph)	268	232	4	651	176	6
Future Volume (vph)	268	232	4	651	176	6
Satd. Flow (prot)	2998	0	0	3344	1672	0
Flt Permitted				0.950	0.954	
Satd. Flow (perm)	2998	0	0	3177	1672	0
Satd. Flow (RTOR)	342				2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	12%	12%	0%	8%	7%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	894	0	0	1172	326	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	4			3	8	2
Permitted Phases				8		
Total Split (s)	39.0		9.0	48.0	32.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effect Green (s)	43.0			43.0	27.0	
Actuated g/C Ratio	0.54			0.54	0.34	
v/c Ratio	0.51			0.69	0.58	
Control Delay	7.9			16.2	26.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	7.9			16.2	26.6	
LOS	A			B	C	
Approach Delay	7.9			16.2	26.6	
Approach LOS	A			B	C	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 14.5

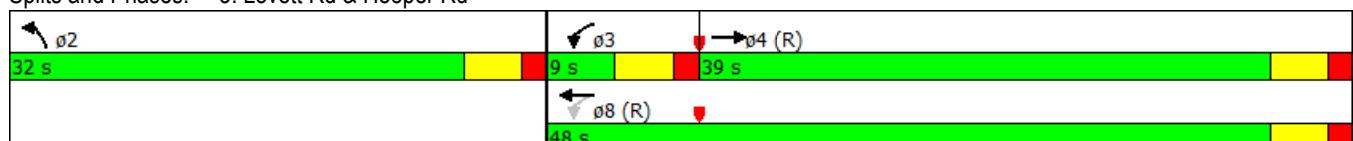
Intersection LOS: B

Intersection Capacity Utilization 58.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd



Future Year 2037 without Improvements

PM Peak Hour

3: Lovett Rd & Hooper Rd

	→	↓	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↑	↑	
Traffic Volume (vph)	841	225	2	360	204	13
Future Volume (vph)	841	225	2	360	204	13
Satd. Flow (prot)	3400	0	0	3439	1751	0
Flt Permitted				0.947	0.955	
Satd. Flow (perm)	3400	0	0	3257	1751	0
Satd. Flow (RTOR)	55				4	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Growth Factor	161%	161%	161%	161%	161%	161%
Heavy Vehicles (%)	3%	2%	0%	5%	3%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	0	0	588	353	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Total Split (s)	41.0		9.0	50.0	30.0	
Total Lost Time (s)	5.0			5.0	5.0	
Act Effect Green (s)	49.6			49.6	20.4	
Actuated g/C Ratio	0.62			0.62	0.26	
v/c Ratio	0.82			0.29	0.79	
Control Delay	16.6			8.2	39.9	
Queue Delay	0.0			0.0	0.0	
Total Delay	16.6			8.2	39.9	
LOS	B			A	D	
Approach Delay	16.6			8.2	39.9	
Approach LOS	B			A	D	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 17.9

Intersection LOS: B

Intersection Capacity Utilization 76.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Lovett Rd & Hooper Rd

